TOWARDS STRATEGIC CONTROL OF TICKS IN THE EASTERN CAPE PROVINCE OF SOUTH AFRICA

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SUMMARY

The performance of alphamethrin and flumethrin treated and untreated Bons-mara cows and calves grazing in the thornveld of the Eastern Cape Province was compared over a 2 year period. The economically important tick species occurred seasonally but in insufficient numbers to achieve enzootic stability with respect to babesiosis and anaplasmosis. No differences in live mass were observed for the cows, but the untreated calves were heavier at weaning than the acaricide treated group. Markedly lower numbers of ticks occurred on the calves than on the cows. The implications of the findings are discussed in relation to planning alternative tick control strategies for the region.

INTRODUCTION

There is a realisation that ticks can never be eradicated by dipping alone (Howell et al., 1981). Furthermore, the implications of a breakdown in an established dipping service (Lawrence et al., 1980) and the occurrence of acaricide resistant ticks has led to a reappraisal of current tick control methods in southern Africa, both by researchers (Norval, 1983; Tatchell et al., 1986) and cattle producers.

The Australian approach to tick control based on the use of strategically applied acaricide, tick resistant cattle and vaccination against tick-borne disease is being considered as a practical proposition in Africa (Sutherst, 1981). Strategic tick control is the application of acaricide at critical times during the year when peak adult tick activity occurs, as it is this instar which appears to cause major losses in body mass, rather than the larvae and nymphae (Norval et al., 1988, 1989). This form of tick control is aimed at maintaining enzootic stability to tick-borne disease through regular transmissions of appropriate pathogens during tick feeding (Callow, 1977).

Although strategic control is advocated as an alternative to the complete reliance on the regular application of acaricide regardless of tick challenge (Norval et al., 1992), there are only a few studies which examine the practical and economic advantages of this approach (Pegram et al., 1989; Fivaz and de Waal, 1993; Scholtz et al., 1991). There is thus a need to apply strategic control on a herd basis under various cattle rearing systems in Africa in order to evaluate its economic advantages.

The University of Fort Hare research farm is situated in an agriculturally impoverished and overgrazed thornveld area of South Africa which supports a peasant population heavily reliant on livestock for their subsistence. Furthermore, the political changes occurring in the subregion have led to interruptions of government dipping programmes which could result in potentially large numbers of cattle deaths, as occurred in Rhodesia (Zimbabwe) during the war in that country (Lawrence et al., 1980).

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The present trial was conducted at Fort Hare in order to evaluate the seasonal dynamics of the endemic tick population, to monitor specific seroconversion with respect to tick-borne disease and to assess the performance of the cattle as a basis for embarking on a strategic tick control programme which could be applied to climatically similar areas in the region.

**MATERIALS AND METHODS**

**Animals**

The experimental cattle comprised mature Bonsmara cows bred on the farm, with newborn calves at foot. The Bonsmara is a composite breed developed from the Afrikaner, an improved indigenous breed of southern Africa, and exotic *Bos taurus* Shorthorn and Hereford breeds (Scholtz et al., 1991).

**Experimental site**

The study took place on the Honeydale experimental farm of the University of Fort Hare, Alice, in the Ciskei (32° 45'S, 26° 50'E), altitude 520 m. The vegetation is classified as False Thornveld (Acocks, 1975). Grazing comprised sweetveld grasses including *Themeda triandra*, *Setaria* spp., *Sporobolus fimbriatus* and *Heteropogon contortus*. Trees were mainly *Acacia karoo*.

Steinbok (*Raphicerus campestris*), common duikers (*Sylvicapra grimmia*), scrub hares (*Lepus saxatilis*) and helmeted guineafowls (*Numida meleagris*) were also found in moderate numbers on the farm.

The grazing was divided into 13 ha paddocks arranged in a wagon wheel formation with a central water point and handling facility. Until the start of the trial the paddocks had been grazed rotationally by cattle and sheep. The cattle had been regularly treated with acaricide over many years at 2 weekly intervals in summer and monthly intervals in winter. The small stock was only treated with acaricide when tick burdens caused foot and udder abscesses (approximately 3 times per year). Heartwater, caused by *Cowdria ruminantium*, occurred very infrequently in the cattle but 5 to 8% of small stock died from the disease per annum. Suspected clinical babesiosis and anaplasmosis were diagnosed by the farm manager in approximately 5% of the cattle per annum.

**Experimental protocol**

Twenty mature Bonsmara cows and their 20 newborn calves were divided into 2 paired groups according to the weight and sex of the calves. Hence each group comprised 10 adult cows and equal numbers of bull (5) and heifer (5) calves.

The 2 groups, designated the tactical and strategic groups, were placed in separate camps within the 12 camp wagon wheel system on the farm and were grazed rotationally in their respective camps for the 2 years of the study. The tactical group grazed camps 1 to 6 while the strategic group grazed camps 7 to 12.

The tactical group was maintained free of ticks by treating with an unregistered pour-on acaricide formulation containing 1% of the synthetic pyrethroid, alphamethrin (Shell) for the first 6 months of the trial, followed by the application of 1% of the synthetic pyrethroid flumethrin pour-on (Drastic Deadline, Bayer), until the end of the trial. The change over to the flumethrin formulation after 6 months was necessitated because it appeared that the alphamethrin was not completely effective in controlling *Boophilus decoloratus* i.e. moderate numbers of ticks appeared on the cattle in February despite the regular applications of alphamethrin.