CONTROL OF CATTLE TICKS IN BRAZIL

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Introduction: Brazil is the world leader in commercial cattle herds. To maintain this leadership, the majority of the country’s cattle breeders constantly strive to improve efficiency, lower production costs and increase the productivity and profitability of their operations. The success of these efforts has helped make Brazil one of the world’s largest producers and exporters of beef.

However, a major obstacle faced by breeders is infestation by the cattle tick Rhipicephalus microplus and the associated infection by Babesia spp. and Anaplasma marginale. The climate conditions are favorable for the development of Rhipicephalus microplus in nearly all areas of the country (Gonzales 1993). Infestations of these ticks cause yearly losses surpassing US$ 2 billion according to estimates by Grisi et al (2002). Despite the great efforts that have been made to advance knowledge of methods to control cattle ticks, relatively little has been accomplished. This article discusses the main control methods that are routinely employed in Brazil.

Tick control on the hosts: The most widespread control method is to combat infestations on the cattle. The infestations in pastures are generally ignored, allowing reinfection. This lapse is a major factor impeding more effective control in the majority of Brazilian herds. Control must be directed not only on the use of acaricides but also on the fixation of alleles for resistance in tick populations expands in animals, always using the recommended dose in a thoroughly homogenized solution with complete application on all body parts of the cattle.

Besides the phenotypic resistance verified by means of bioassays, the occurrence of genetic mutations has been confirmed in populations submitted to repeated contact with insecticides. The fixation of alleles for resistance in tick populations expands in response to persistent use of base chemicals, since the ticks sensitive to each substance are eliminated from the population. It must be remembered that once a determined tick population acquires resistance to a base chemical, the ticks will also have resistance to all acaricides belonging to the same drug group. The reversal of resistance has only been observed for amidin.

One way to overcome these problems has been to develop the so-called strategic control method. This method tries to maximize the action of acaricides by considering aspects related to the tick life cycle, choice of the most efficient chemical and best application technique, etc. Bioassays are used to determine the resistance of populations to specific acaricides. After choosing the best insecticide for the particular ranch or region, breeders use a series of five or six consecutive baths, with 21-day intervals, in the hottest (and wettest) months of the year. The reason is that during the hot and wet season, even though the climate conditions are favorable for the development of ticks, the high temperatures also enhance the mortality of the larvae in pastures. This method also stresses the correct application on the animals, always using the recommended dose in a thoroughly homogenized solution with complete application on all body parts of the cattle.

Another trend in Brazil is the use of natural substances to control ticks. The presence of chemical residues in meat, milk and the environment has prompted interest in finding new, less toxic, substances to control ticks. The extracts of various plants that are native to the tropics and subtropics are being tested and some have demonstrated activity against various tick species. Among these are the essential oils of Eucalyptus spp. and extracts of Copaifera reticulata, Melia azedarach and Azadirachta indica (neem), among others. However, such studies are still in the experimental phase and in the short run these substances are not available for systematic use on commercial herds.

Another method to control ticks is to use vaccines that provide host resistance, without previous contact with the ticks. At present two vaccines are available in the market, using as immunogen a protein from the intestinal membrane of R. microplus. However, field studies in Brazil of the Tick-GARD vaccine, produced in Australia, in areas with high natural tick infestations revealed that it alone was not able to control the target tick (Pereira et al 2008).

Finally, the use of cattle breeds with greater resistance to ticks has proved to be a very effective alternative for control of these parasites. Frisch (1997) classified Bos indicus cattle (African and Indian Zebu) as having high resistance, Bos taurus cattle of the Sanga group as having intermediate resistance, and Bos taurus breeds of British and European origin as having low resistance. The Nelore zebu breed is the most widespread in Brazil. One of its main characteristics is natural resistance to ticks. This breed has been crossed with the taurine breed to reduce the negative impacts caused by tropical conditions in Brazil.

Control of ticks in pastures: Another promising alternative to control ticks is to reduce the number of larvae in pastures. The main ways this can be achieved are through rotation of paddocks or grazing areas and the use of forage grasses that do not favor the development of ticks. The first alternative consists of keeping grazing areas free of cattle until the larvae die. However, this method can be difficult in small properties because there is not enough space to leave pasture areas at rest for the long periods that are needed to free them of larvae.

The use of grasses that repel or do not favor the development of ticks is the other most common measure, but it often has drawbacks. The main problem is that many grass species that are repellent to ticks also do not have the proper nutritional characteristics for cattle. Among the species recognized as inhibiting the development of ticks are Stylosanthes spp., Melinis minutiflora and Andropogon gayanus (Jonsson and Piper 2007).
**Key words:** ticks, control, cattle.

**References:**


