

## OUTSOURCING IN CATTLE ECTOPARASITE CONTROL – A PROMISING OPPORTUNITY

Wilson Werner Koller

Embrapa Beef Cattle. Postal Box 154, Postal Code 79002-970, Campo Grande, MS, Brazil.  
E-mail: [koller@cnpqg.embrapa.br](mailto:koller@cnpqg.embrapa.br)

### **Abstract**

The control of pests that reduce production and overall food quality is performed, in all parts of the world, based on production costs. However, the cost-benefit relationship rarely takes into account the actual measurement criteria, i.e., which is the selection of pesticide products and application processes considering only the lowest purchase price. Moreover, this economy may also include reductions in the number of applications, amount of product applied and/or applications targeting only specific animal groups or infested areas. Such behavior implies very efficient pest control and an increase in pressure for the selection of resistant populations. In Brazil, official programs are urgently needed for strategic and systematic control of some agricultural pests responsible for large annual losses. In livestock, although studies have resulted in recommendations for strategic control of some important pests, such as cattle ticks and horn flies, these recommendations have been little utilized and lack regulation by the relevant authorities. This scenario may change in the short term in function of the current restrictions on international trade in the form of sanitary barriers. Consumers are increasingly aware that food safety is more important to human health than purchasing the cheapest foods, because ultimately, the savings in the purchase of unhealthy foods may be insufficient to recover one's health if impaired by these foods. Food production can be maximized, in terms of food quantity and quality, by the use of inputs, sustainable techniques and processes, in which savings are considered which include the capital invested and the returns obtained in the short, medium and long terms. The return in question involves the entire production chain, market, environment and human health - both of the consumers

and those which make up the production chain. Therefore, as part of developing sustainable processes for food production, in this work it is suggested that control of agricultural pests be handled professionally in the country, training outsourced personnel capable of being sustained by the cost/benefit return of the services that they provide.

**Key Words:** sanity livestock sustainability

### **Basis of the Proposal**

Records of the occurrence of resistant populations of cattle parasites are becoming increasingly frequent in different regions of the country. These reports refer in general to the horn fly, *Haematobia irritans* (Rodrigues et al., 2002; Barros et al., 2002; 2007), and the cattle tick, *Rhipicephalus (Boophilus) microplus* (Fernandes, 2001; Oliveira and Azevedo, 2002; Rocha et al., 2006; Furlong et al., 2007; Mendes et al., 2007; Farias et al., 2008; Koller et al., 2009b; Catto et al., 2010). However, with the increased cultivation of sugar cane to produce sugar and ethanol, the stable fly, *Stomoxys calcitrans*, is becoming a serious problem in livestock farms in the vicinity of sugarcane mills, especially because it has shown to be resistant to pesticides currently available (Koller et al., 2009a; Barros et al., 2010).

The damages caused annually to national livestock production by the above mentioned cattle ectoparasites were estimated by Grisi et al. (2002) as being on the order of 2 billion U.S. dollars by the tick, 150 million caused by the horn fly, and 100 million by stable flies. With respect to the horn fly, Bianchin et al. (2004) reported a ten percent loss in body weight of the Nelore animals evaluated. From this information, based on the projected number of animals to be slaughtered in the country two years later (Anualpec), the price of meat and the exchange rate to the dollar, these same authors estimated an annual loss of 865 million dollars (Bianchin et al., 2006). The estimate of damage caused in a given year depends, therefore, on

the values assumed for these three variables in the current year, as well as the cost of the control practiced. Additionally, Zebu animals are known to be more resistant to ectoparasites than *Bos taurus* or their crossbreeds (Bianchin and Alves, 2002; Veríssimo et al., 2002), which implies an increasing trend in losses as the national herd, predominantly zebu, becomes increasingly influenced by the participation of European breeds.

The misuse and indiscriminate use of pesticides can accelerate the process of resistance to different chemical bases and allow the occurrence of multiple or cross resistance. In Brazil, this has been happening not only with respect to tick control (Freitas et al., 2005; Rocha et al., 2006; Farias et al., 2008) but also the horn fly, *Haematobia irritans* (Barros et al., 2007), where, due to the lack of specificity in most of the products used, control of one species tends to affect the susceptibility of the other. Ultimately, in the case of ticks, the high frequency of treatments associated with inappropriate use of products has resulted in populations becoming resistant to the few acaricides groups available on the domestic market (Martins, 1996; Silva et al., 2000; Furlong et al., 2007).

Furlong et al. (2007) found that only two of the 24 acaricide products evaluated in Minas Gerais and neighboring states presented a satisfactory effect. These were composed of cypermethrin + chlorpyrifos + citronellal + piperonyl butoxide, showing a 99.8% efficiency, followed by cypermethrin + chlorpyrifos (98.9%). In the evaluations conducted by Koller et al. (2009b), the latter product exhibited efficacy between 16.71% and 100% (average of 82.68%), suggesting the occurrence of resistance not only to the pyrethroid but also to organophosphate in some of the farms sampled in Mato Grosso do Sul, Brazil.

Generally, in rural areas there is an elevated deficiency in regards to access to technical information that could aid in the correct use of anti-parasite products. A clear resistance or negligence of the producers to adoption of recommended techniques has also been observed, such as, for example, the tick strategic management proposed by Furlong et al.

(2003). An aggravating factor with regards to the issue of tick resistance is represented by the frequent finding of poor management on most farms, including: the systematic use of a single product or chemical base, treatment used only after verify the presence of adults, excessive applications per year due to the decreased residual strength of the products (Martins, 2004; Furlong et al., 2007; Farias et al., 2008) and inadequate control of the horn fly, with insufficient volume and by treating only the most infested animals (Barros, 2005).

## **Conclusion**

The current costs of the ectoparasites control system in the Brazilian cattle industry, and the negative economic and social impacts arising from the misuse of pesticides may be reduced. It is suggested that this control be performed by outsourced professionals trained for this purpose with the expectation of gains in productivity of the heard, savings in production costs and multiple benefits to food security and the environment.

## **References Cited**

Barros, A.T.M., Gomes, A., Ismael, A.P.K., and Koller, W.W. 2002. Susceptibility to diazinon in populations of the horn fly, *Haematobia irritans* (Diptera: Muscidae), in Central Brazil. Mem. Inst. Oswaldo Cruz 97: 905-907.

Barros A.T.M. 2005. Aspectos do controle da mosca-dos-chifres e manejo de resistência. Documentos, 77. Embrapa Pantanal: Corumbá. 23p.

Barros, A.T.M., Gomes, A., and Koller, W.W. 2007. Inseticide susceptibility of horn flies, *Haematobia irritans* (Diptera: Muscidae), in the State of Mato Grosso do Sul, Brazil. Rev. Bras. Parasitol. Vet. 16: 145-151.

Barros, A.T.M., Koller, W.W., Catto, J.B., and Soares, C.O. 2010. Surtos por *Stomoxys calcitrans* em gado de corte no Mato Grosso do Sul. Pesq. Vet. Bras. 30: 945-952.

Bianchin, I., Alves, R.G.O., and Koller, W.W. 1997. Efeito de alguns carrapaticidas/inseticidas de aspersão sobre os adultos de *Onthophagus gazella* (F.). Ecosist. 22: 116-119.

Bianchin, I., Alves, R.G.O., and Koller, W.W. 1998. Efeito de carrapaticidas / inseticidas “Pour-on” sobre adultos do besouro coprófago africano *Onthophagus gazella* Fabr. (Coleoptera: Scarabaeidae). An. Soc. Entomol. Brasil 27: 275-279.

Bianchin, I. and Alves, R.G.O. 2002. Mosca-dos-chifres, *Haematobia irritans*: comportamento e danos em vacas e bezerros Nelore antes da desmama. Pesq. Vet. Bras. 22: 109-113.

Bianchin, I., Koller, W.W., Alves, R.G.O., and Detmann, E. 2004. Efeito da mosca-dos-chifres, *Haematobia irritans* (L.) (Diptera: Muscidae), no ganho de peso de bovinos Nelore. Ciênc. Rural 34: 885-890.

Bianchin, I., Koller, W.W., and Detmann, E. 2006. Sazonalidade de *Haematobia irritans* na região do Brasil Central. Pesq. Vet. Bras. 26: 79-86.

Farias, N.A., Ruas, J.L., and Santos, T.R.B. 2008. Análise da eficácia de acaricidas sobre o carrapato *Boophilus microplus*, durante a última década, na região sul do Rio Grande do Sul. Ciênc. Rural 38: 1700-1704.

Freitas, D.R.J., Pohl, P.C., and Vaz, J.R. I.S. 2005. Caracterização da resistência para acaricidas no carrapato *Boophilus microplus*. Acta Scient. Vet. 33:109-117.

Fernandes, F.F. 2001. Efeitos toxicológicos e resistência a piretróides em *Boophilus microplus* de Goiás. Arq. Bras. Med. Vet. Zootec. 53: 538-543.

Furlong, J., Martins, J.R., and Prata, M.C. 2003. Carrapato dos bovinos: controle estratégico nas diferentes regiões brasileiras. Comunicado Técnico, 36. Embrapa Gado de Leite: Juiz de Fora, MG. 5p.

Furlong, J., Prata, M.C.A., and Martins, J.R. 2007. O carrapato dos bovinos e a resistência: temos o que comemorar? Hora Vet. 27: 26-32.

Grisi, L., Massard, C.L., Moya-Borja, G.E., and PEREIRA, J.B. 2002. Impacto econômico das principais ectoparasitoses em bovinos no Brasil. Hora Vet. 21: 8-10.

Koller, W.W., Catto, J.B., Bianchin, I., Soares, C.O., Paiva, F., Tavares, L.E.R., and Graciolli, G. 2009a. Surtos da mosca-dos-estábulo, *Stomoxys calcitrans*, em Mato Grosso do Sul: novo problema para as cadeias produtivas da carne e sucroalcooleiras? Documentos, 175. Campo Grande: Embrapa Gado de Corte, 2009. 31p.

Koller, W.W., Gomes, A., and Barros, A.T.M. 2009b. Diagnóstico da resistência do carrapato-do-boi a carrapaticidas em Mato Grosso do Sul. --Dados eletrônicos -- Campo Grande, MS: Embrapa Gado de Corte, 2009. 47 p. (Embrapa Gado de Corte. Boletim de Pesquisa e Desenvolvimento, 25). Disponível em: <<http://www.cnpqg.embrapa.br/publicacoes/bp/BP25.pdf>>. Acesso em: 11 mar. 2011.

Martins, J.R. 1996. Situação da resistência a carrapaticidas no Rio Grande do Sul: diagnóstico de situação. Veterinária, Montevideo, 32: 12-14.

Martins, J.R. 2004. Manejo da resistência aos carrapaticidas. Revta Bras. Parasitol. Vet. 13:114-115.

Mendes, M.C., Pereira, J.R., and Prado, A.P. 2007. Sensitivity of *Boophilus microplus* (Acari: Ixodidae) to pyrethroids and organophosphate in farms in the Vale do Paraíba region, São Paulo, Brazil. Arq. Instit. Biol. 74: 81-85.

Oliveira, A.A. and Azevedo, H.C. 2002. Resistência do carrapato *Boophilus microplus* a carrapaticidas em bovinos de leite na região dos tabuleiros costeiros de Sergipe. Rev. Cient. Rural 7: 64-71.

Rocha, C.M.B.M., Oliveira, P.R., Leite, R.C., Cardoso, D.L., Calic, S.B., and Furlong, J. 2006. Percepção dos produtores de leite do município de Passos, MG, sobre o carrapato *Boophilus microplus* (Acari: Ixodidae), 2001. Ciênc. Rural 36: 1235-1242.

Rodrigues, S.R., Sanches, C.S., Fialho, E.M.L.M., Ismael, A.P.K., and Barros, A.T.M. 2002. Comercialização e uso de produtos inseticidas para controle da mosca-dos-chifres em Aquidauana, MS. Boletim de Pesquisa e Desenvolvimento, 32. Corumbá: Embrapa Pantanal, 2002. 23 p.

Silva, M.C.L., Sobrinho, R.N., and Linhares, G.F.C. 2000. Avaliação in vitro da eficácia do clorfenvinfós e da cialotrina sobre o *Boophilus microplus*, colhidos em bovinos da bacia leiteira da microrregião de Goiânia, Goiás. Ciênc. Anim. Bras. 1:143-148.

Veríssimo, C.J., Otzuk, I.P., Deodato, A.P., Lara, M.A.C., and Bechara, G.H. 2002. Infestação por carrapatos *Boophilus microplus* (ACARI: IXODIDAE) em vacas Gir, Holandesa e mestiça sob pastejo. Arq. Instit. Biol. 69: 87-89.