

# Towards a rational policy for dealing with tsetse

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**The past 20 years have seen the development of bait technologies that enable livestock keepers to control tsetse flies and, hence, African trypanosomiasis. The techniques have, however, often been applied on too small a scale, without due regard to the realities of tsetse population dynamics. The consequent lack of progress has led to calls for a return to large-scale operations. Analysis of successful programmes to control or eliminate tsetse in southern Africa suggests that the combined use of recently improved bait methods and insecticide spraying will provide the building blocks for achieving the wider objective of the African Union, which is to create large tsetse-free zones.**

## The way we were

In the mid-1980s, the days of tsetse seemed numbered. In southern Africa, a programme to eliminate tsetse from a 'fly belt' of 320 000 km<sup>2</sup> covering Malawi, Mozambique, Zambia and Zimbabwe was initiated with support from the European Union [1]. In East Africa, a UK-supported project aimed to use aerial spraying to eliminate the main tsetse infestation in Somalia. In Zimbabwe, ground spraying and aerial spraying were used to control tsetse over ~10 000 km<sup>2</sup> annually [2], and in West Africa riverine species of tsetse were controlled with traps [3].

Other technologies that are more cost effective were also developed. Odour-baited targets were used successfully on a large scale [4], and work in Zimbabwe showed that pyrethroid-treated cattle might even be more cost effective [5]. The technologies, money and people needed to control tsetse were, thus, in place and even environmental concerns about large-scale tsetse control seemed calmed [6]. Consequently, the late 1980s saw a general increase in the number of large operations and the use of bait technologies [2,3,7].

## Small is beautiful?

During the 1990s, however, progress and prospects changed. European donors, major supporters of tsetse control, abruptly shifted spending to other areas. Under the political and economic view of the day, livestock ownership was a commercial enterprise and those who benefited directly from it should, accordingly, fund tsetse control. This view was made feasible only by the newly

developed bait technologies that, in contrast to spraying operations, could be applied by local communities.

Unhappily, the result of this policy was that the effective new tools of odour-baited targets and insecticide-treated cattle were applied on inappropriate scales. Moreover, the policy of community participation was applied without due regard to the dynamics of tsetse populations and their control. The basic reason for this is that the scale of community-based operations is governed by the social factors that enable groups of livestock keepers to cooperate. Consequently, the operations covered areas of just 50–500 km<sup>2</sup> [8], compared with the 5000–10 000 km<sup>2</sup> tackled by aerial and ground spraying. But the mobility of tsetse means that, even if baits were optimally deployed, tsetse could penetrate ~5 km into a control area [4]. Consequently, an operation covering 100 km<sup>2</sup> and surrounded by infested land could not eliminate tsetse. Moreover, community-based control operations are dependent on pooling private resources to achieve a 'public good'. Problems inherent in any collective action, allied to a lack of technical advice and the economic constraints faced by poor communities in rural areas, mean that effective baits are seldom optimally deployed [9]. The demands of grazing and watering livestock also mean that, even if cattle were treated adequately with insecticide, they would still be distributed patchily. In these circumstances, invasion of the control area is exacerbated and trypanosomiasis control is not effective [10].

Livestock owners do, however, have an important role in trypanosomiasis control; each year, they administer ~35 000 000 doses of trypanocides, at approximately US\$1 per treatment, to cure or prevent the disease [11]. This easy intervention requires no liaison with neighbours, and the benefits are rapid, obvious and accrue entirely to the implementer. Thus, farmers choose to treat the disease rather than prevent it and would probably engage appreciably in tsetse control only if it were as cheap and simple as using drugs.

This goal might yet be achieved using insecticide-treated cattle. Insecticide usage can be reduced by ~90% by treating only the larger cattle within a herd and only the legs and belly, where most tsetse feed [12,13]. Moreover, pyrethroid prices have declined as patents have expired and commercial competition has increased. Consequently, tsetse control in cattle areas might be achieved for less than US\$1 per animal per year [14]. The new technique reduces the need for plunge dips and is

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Available online 2 September 2005