

Fighting tsetse diseases in Africa

by Evans D. Offori

The scourge of the tsetse fly has evoked discussion ever since the devastating effects of the fly's feeding activities became known to man. The tsetse bites both human and livestock, and, in the process, transmits the parasite *Trypanosoma*, which causes sleeping sickness in humans and nagana in livestock. Efforts of national governments, non-governmental organizations, and international bodies in combating the tsetse to eliminate diseases it transmits are well documented.

For many years, the menace of tsetse in Africa was fought by either singly or in combination altering the fly's habitat, removing its natural food source -- wild game -- or spraying insecticides to kill the adult insect. While each of these methods has resulted in some measure of success, it is nevertheless true that traditional methods of tsetse control have not always succeeded in totally eliminating fly populations. Additionally, especially during the past two decades, considerable reservations have been expressed about unfavourable environmental effects from such well-known methods as bush clearing, game elimination, and area application of insecticides.

Alternative needed

The need for other effective, environmentally safe approaches prompted the Joint FAO/IAEA Division of Isotopes and Radiation Applications of Atomic Energy for Food and Agricultural Development to establish a programme and laboratory facilities 15 years ago in Seibersdorf, Austria. The programme's objective is to develop, test, and evaluate methodologies based on the use of nuclear techniques for tsetse eradication. Specifically, the Joint FAO/IAEA Division's tsetse programme has, during this period, emphasized research and development activities aimed at applying the Sterile Insect Technique (SIT) for tsetse eradication or control. (In this case, SIT involves the sterilization and release of large numbers of tsetse to slow their propagation in areas where control is desired.)

Since 1970, pilot demonstrations of the technique have shown its effectiveness in suppressing tsetse populations in several areas of Africa, notably Tanzania, Upper Volta and Zimbabwe.

Encouraging results to date -- from two major on-going tsetse SIT programmes in Nigeria and Upper

Volta -- were partly the basis for organizing a recent seminar in Lusaka, Zambia.* The five-day seminar was hosted by the Government of Zambia and attracted 57 participants from 17 African countries and three international organizations. Opening ceremonies -- attended by His Excellency President Kaunda of Zambia -- drew more than 400 observers.

The meeting afforded tsetse scientists, tsetse control officers, and administrators alike the opportunity to exchange views on current and future tsetse control strategies, especially with a view to integrating the SIT into national and area-wide control programmes.

Major constraint: funding

Participants from the 17 African countries represented were unanimous in pointing out that the single major constraint to an effective tsetse control programme was lack of sufficient funds in most of the affected countries. For most countries, therefore, external assistance -- especially through international organizations -- would be required to undertake a meaningful programme.

In addition to thorough explanations of the SIT principle, its advantages and disadvantages, lectures were presented on laboratory and field activities planned in preparation for applying the technique and in support of practical programmes. The development of mass-rearing techniques was emphasized, including the use of artificial feeding methods and synthetic diets. Slides and actual models explained and illustrated the use of traps, impregnated screens, and other "inexpensive" and non-polluting population suppression techniques. Also highlighted and duly acknowledged were contributions of various research laboratories in Europe and Africa in developing the SIT for use against tsetse.

Generating considerable interest was a lecture on the rôle of *trypanosomiasis* surveys in tsetse SIT programmes. Participants agreed that such a survey was as essential as tsetse surveys, and should always precede any plan or proposal to control or eradicate tsetse in a particular area.

Field applications of the SIT for tsetse eradication were illustrated by a detailed description of laboratory research at Seibersdorf, mass-rearing operations, and field activities at the Agency-supported project (BICOT),

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* The seminar, held from 25 to 29 June 1984, was officially entitled "The Sterile Insect Technique for Tsetse Eradication or Control in Developing Countries in Africa."



His Excellency President Kaunda of Zambia officially opened the FAO/IAEA seminar, which his country hosted in Lusaka, that focused on regional applications of nuclear techniques to help control devastating health effects caused by tsetse flies. Two major tsetse-control projects in Africa are showing encouraging results.

in Vom, Nigeria.* Results of sterile-male releases undertaken in the project area during the past 18 months indicated complete eradication in several forest patches. Substantial reduction in fly population had been achieved in other areas using insecticide-impregnated screens and biconical traps. This would be followed by sterile-male releases in the near future.

The technical sessions concluded with panel discussions on three topics: (1) tsetse population management in relation to the SIT; (2) integrating the SIT into national and regional tsetse control programmes; and (3) research and training needs in support of such tsetse SIT programmes.

Suggestions for future action

Although the meeting called for no formal recommendations, presentations by panelists and participants during general discussions highlighted suggestions for future action. For example, participants pointed out the need to develop simple trapping devices and to standardize tsetse sampling techniques to facilitate comparison of results by different workers and on

different species of tsetse. Continued research was advocated for improving the efficiency of existing traps and screens.

The idea of regional co-operation in developing SIT programmes was strongly advocated by several speakers. As a concrete step towards such a programme, it was suggested that consideration should be given to setting up regional mass-rearing centres that would supply tsetse pupae to various countries. The facilities in Nigeria and Upper Volta could serve West Africa, while the one in Tanga, Tanzania, and another, possibly in Zambia, could serve East and Central Africa.

With regard to research and training needs, seminar participants acknowledged the effort of the Joint FAO/IAEA Seibersdorf Laboratory in training tsetse workers from Africa, and pointed out the need to train more graduate-level personnel in SIT-related disciplines. The importance of trainees spending some of their training in on-going field projects was emphasized.

Finally, it was suggested that perhaps the Joint Division should consider procuring a well-equipped van that could be used for conducting tsetse SIT workshops. The idea would be for the "mobile workshop" to tour various African countries and conduct on-the-spot training in each country.

* See "Atoms for pest control" in *IAEA Bulletin*, Vol.26, No.2.