

TSETSE FLIES AS A LIMITING FACTOR TO THE FULL UTILISATION OF THE NATURAL GRAZING IN RHODESIA BY DOMESTIC STOCK

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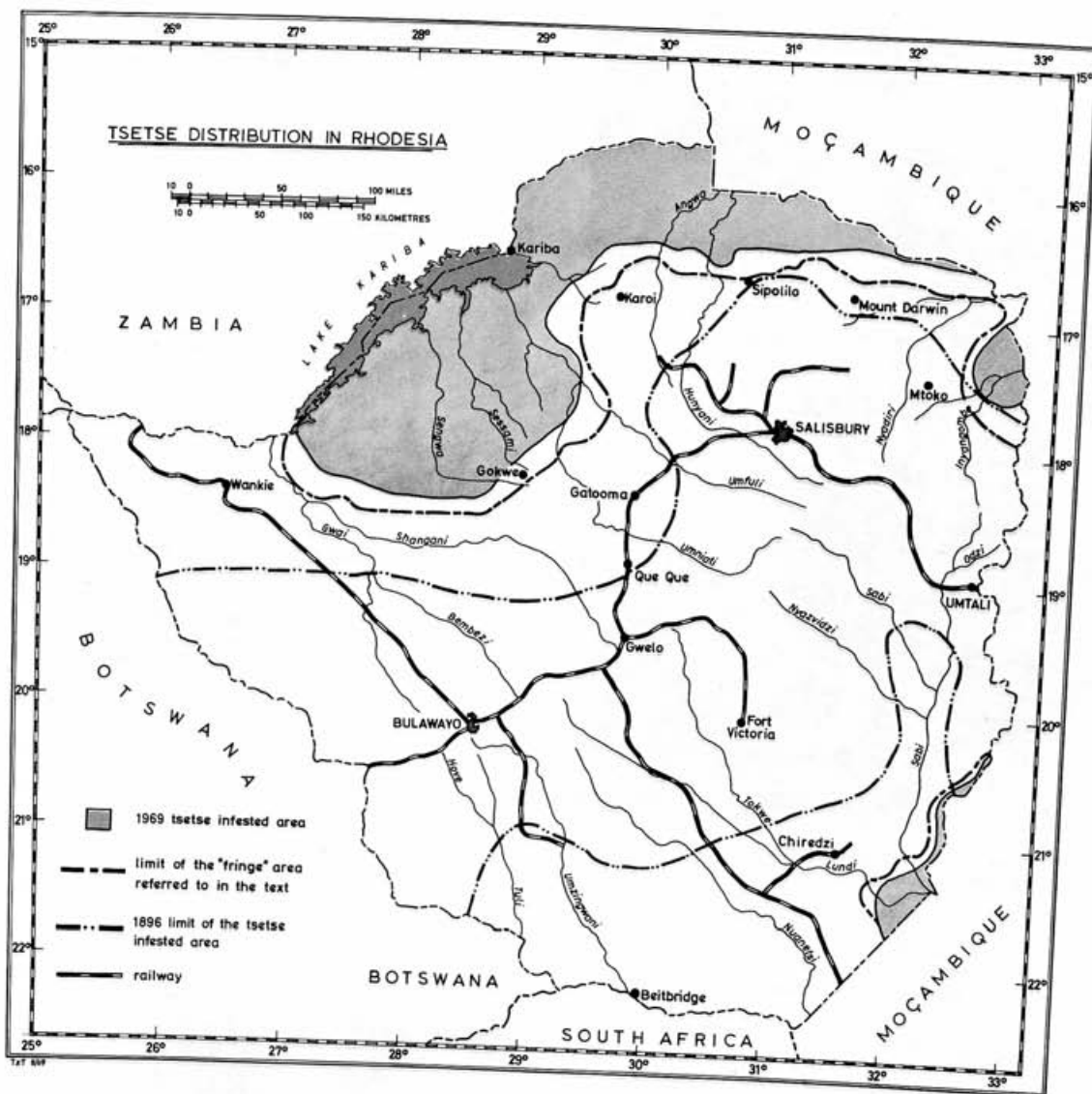
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APPROXIMATELY one seventh of the natural grazing area in Rhodesia is denied to domestic stock at the present time because of the presence of tsetse flies. Further areas are also threatened by invasion by these insects. Considerable expenditure and effort is directed annually to controlling these flies and the disease they transmit to domestic stock. There are encouraging indications that the overall situation is being stabilized and that within the foreseeable future it should become possible to undertake the reclamation of the infested areas lying beyond the present scene of operations at reasonable cost. What the best form of utilisation for this land should be is uncertain but it is stressed that unless there is radical change in the outlook of the tribesman then this will almost certainly involve the maintenance of cattle. There is therefore the urgent need to plan and control the ultimate utilisation otherwise the uncontrolled spread of cattle could be disastrous to this relatively untouched natural grazing.

At the present time some 22,000 square miles of bushland and woodland within Rhodesia are infested with tsetse flies, *Glossina morsitans* Westw. and to a lesser extent *G. pallidipes* Aust. and the grazing within this area (or areas since the infestation is not continuous) is denied to domestic stock because of the usually fatal disease which is transmitted by these insects, namely trypanosomiasis or nagana. Again, some 8,000 square miles of land lying along the fringes of the infested areas, which in most cases are settled by tribesmen, are affected by occasional incursions of tsetse flies or by the inevitable "carried fly" from the infested areas beyond causing sporadic trypanosomiasis amongst the resident domestic stock. Furthermore there is that area of about 46,500 square miles lying approximately between the affected fringe region (mentioned above) and the 3500' contour, which was originally infested with tsetse flies prior to the great rinderpest epizootic of 1896, and which, should control be removed, would be liable to relatively rapid reinfestation. Such is the problem as it exists in Rhodesia.

The efforts of the Branch of Tsetse and Trypanosomiasis Control, Department of Veterinary Services, the organisation responsible for the control of tsetse flies and of the disease, trypanosomiasis, in Rhodesia, are currently entirely directed to regaining the status quo held previously along the fly fronts, but which was lost in the period 1956 - 1960 when, because of well-meaning, but very misinformed public opinion, game elimination, as a means of tsetse control, was terminated in favour of control by bushclearing and by the use of modern insecticides applied from aircraft as aerosols or by ground spraying as residual deposits to tsetse resting and refuge sites. Regrettably, these other methods proved quite inadequate in the face of fly belts which always have a potential for expansion and of fly fronts which are exceedingly long, the Zambesi fly front being 675 miles in length. It was not within the capabilities of the organisation to apply control measures

at all the points of pressure with these methods, which, with the knowledge available at the time were only suitable for local application. It therefore became necessary in 1964 to reinstitute game elimination, albeit on a new and restricted basis, as the primary means of control along the fly fronts, supplemented where possible by the ground application of residual insecticides to tsetse resting and refuge sites. Briefly, the modifications to the game elimination technique involved the restriction of the species to be removed to the preferred food hosts only, namely warthog, bushpig, kudu and bushbuck, as determined by the identifications of many hundreds of tsetse blood meals from the Rhodesian fly-belts. Elephant and buffalo are also driven out or destroyed, chiefly as a fence protection measure (the fly fronts are delimited for the most part by 6' high, 8 strand, high-strain steel wire fences), but also because they are known to be utilised as food hosts to quite a large degree when present in an area. It is noteworthy that just prior to the decision to resort to game elimination again, the efficacy of this modified technique, now called selective game elimination, was proven in a limited operation in the Sebungwe Operations Area, Binga district, which has come to be known as the Nagupande Operation (Cockbill 1963). These selective game elimination operations are limited to defined areas along the fly fronts, the total area of these together being 11,245 square miles. Similarly, the control method involving the application of residual insecticides to tsetse resting and refuge sites has been greatly refined over the past few years, and today it is possible to effect rapid control and even complete eradication of tsetse flies over relatively large areas of infested country at comparatively low cost. For instance, during the dry season of 1968, the Branch carried out a spraying operation in the Gokwe, Gatooma and Lomagundi districts, using a 5 per cent suspension of DDT wettable powder, in which the total area of fly infested bushland and woodland covered during the operation exceeded 1700 square miles (Lovemore et al 1969). The results



of this operation to date have been highly satisfactory and it can now be safely said that the critical easterly and south easterly fly advance, which was threatening the Lomagundi and Gatooma European farming areas and which had involved the Copper Queen and Chenjiri purchase areas and the Sanyati and Umfuli Tribal Trust Land areas, has been arrested. It is noteworthy that the total cost of this operation was £42,400 of £25 per square mile approximately.

Brief mention must also be made at this juncture of the important role which the various trypanosomocidal drugs have played during the difficult times experienced since 1961. Suffice it is to say that without the excellent drugs and the veterinary organisation which has been responsible for their administration, it is certain that

many of the cattle in those areas which were overrun by tsetse after 1960 would have died. In many cases, cattle have been protected in the face of heavy trypanosome risk by the judicious use of prophylaxis or by regular curative therapy whilst anti-tsetse operations necessary to combat the particular problem were being mounted. It is of interest that the number of cattle at risk for the year ended 30th September, 1968, exceeded 388,000 (Cockbill 1968a). It must be emphasised, however, that the utilisation of drugs can only be regarded, at the most, as palliative, the only certain solution being elimination of the vector, for though it is true that cattle and other domestic stock can be maintained reasonably satisfactorily in tsetse-infested country, as has been done on the Branch's two field research stations, the problems involved are many. In



Applying 5 per cent DDT WP suspension to an ideal refuge site in drainage line vegetation in the Zambesi Valley.
 Photograph by G. F. Cockbill

particular, there is the one which is always of great concern to the drug therapist, namely the ever-present danger of drug resistance.

It has been suggested from time to time over the years, and in various ways, often in all seriousness, that the existing approach to the problem is wrong and that more attention should be paid to the phenomenon of natural tolerance which is exhibited by the majority of game animals to trypanosome infections, in order to provide a satisfactory solution to the problem, i.e., if interpreted correctly, that game animals should be utilised instead of cattle within the tsetse infested areas of Rhodesia, either by farming those species which show a potential for domestication, or by ranching the existing spectrum of game animals occurring within any particular area. These ideas are interesting but fail to provide a solution for the interface between the fly infested country and the country stocked with cattle and other domestic stock. To implement them would involve either a withdrawal of all control, with a return to the situation which prevailed prior to 1896, with domestic stock on the highveld and game animals occupying the middle and low veld areas (albeit the latter on a utilisation basis), or else Govern-

344

The Rhodesia Science News Vol. 3. No. 11—November 1969

ment would be obliged to continue, *ad infinitum*, to maintain an area of control as a barrier along the existing fronts, with that country lying within the fly belts being turned over to game farmers or ranchers, either European or African. Both ideas are unacceptable, the first because it would invite disaster to a large portion of our national herd and the second because it would perpetuate the existing problems. The first idea need not be discussed further, and in the case of the second, it would be quite wrong to go on holding a line year after year, always at great cost, when with intelligent planning, but with very little extra effort and expenditure, the "carpet could be gradually rolled up" over a period of years. Recent successes with the application of residual insecticides to the resting and refuge sites of tsetse flies would suggest that such an approach is feasible, and, as time proceeds, will become increasingly more so because, as each spraying season passes so does our efficiency and "know how" improve. It must be emphasised, however, that it would be wrong to make a start on this gigantic undertaking before the existing fly fronts have been stabilised and the detailed planning for the task in question completed on a long term basis, including, in particular, the adoption of a rational land use policy for the land to be reclaimed.

It is not the function of the Branch of Tsetse and Trypanosomiasis Control, Department of Veterinary Services, to decide on land use policies. It may well be that the game farming and ranching protagonists are right and that the land in question would be utilised to best advantage by an economy based on game. Generally speaking such land falls within Vincent and Thomas's (1960) agro-ecological land categories IV, V and XX. Regions IV and V are particularly suitable for beef production and XX is defined as "Unsuitable for any form of agricultural utilisation: Suitable only for

Cattle suffering from trypanosomiasis or nagana in the Matisi T.T.L., Inyanga District.

Photograph by W. P. Boyd.





A section of the Angwa-Msengedzi Game Fence, Sipolilo Operations Area. The Branch maintains 850 miles of such fence along the flyfront perimeters.

nature reserves". It would thus appear that this land is mostly of a marginal nature. However, the crux of the whole matter is that the greater part of the infested country falls within the Tribal Trust Land category with the balance being made up of a few small game reserves, forest areas and some "Unreserved Land", and therefore the final utilisation for the most part will almost certainly involve cattle. This might appear to be a pessimistic outlook but without radical change on the part of the tribesman this can be the only end result. To emphasise this point further the only factor preventing the immediate settlement of those areas which have already been developed for settlement by the Ministry of Internal Affairs within tsetse infested country (all part of the overall reclamation plan) is that potential settlers are not permitted to take cattle into these areas with them and therefore they invariably decline to take up the offers of land when these are made.

Finally it is considered appropriate in this context and as a word of warning to quote Cockbill (1968b) who wrote in a previous issue of this journal as follows:-

"Effective methods of tsetse control are available and are being used with success in Rhodesia. Research is directed towards refining them, to make them more selective and thus more economical. Even now, it can be claimed that the ultimate control of the fly is a matter of logistics - to get enough skilled personnel with enough material into the correct place at the correct time. But if the elimination of the fly in Rhodesia can be contemplated, its consequences must be seriously and conscientiously considered. What social changes will take place if hundreds of square miles of territory, now denied to man and his cattle are made available for settlement and cattle owning tribesmen? Are these areas of wooded savannas and wide vleis, the home of our varied game species and abundant bird life, where only an occasional village is to be seen, where roads are few and poor and only the venturesome go - are these to be transformed into vast tracts of treeless, grassless, eroded desert, overstocked and overgrazed

by people who demand more and yet more land for their emaciated stock?

At the present time tsetse control operations are organised to halt the advances which have taken place since 1960 into settled agricultural areas. When that has been achieved and the tsetse front has been stabilised, demands will be made to make uninhabited areas free of tsetse flies. It must be made a condition of occupancy of these areas that holdings of stock shall not exceed the carrying capacity of the land and that the stock be treated as a crop. Unless a rational form of land use is introduced to these new areas it would be better to assign the land to the tsetse fly forever."

Acknowledgement

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The favoured food host of *Glossina morsitans* Westw. in Rhodesia. Photo by Ministry of Information.

