

Article 4
Reference: G/1/76.

TSETSE AND TRYPANOSOMIASIS CONTROL BRANCH,
DEPARTMENT OF VETERINARY SERVICES,
P.O. BOX 8283,
CAUSEWAY.

GFC/DPA.

21st October, 1970.

The Secretary,
Ministry of Agriculture.

TSETSE AND TRYPANOSOMIASIS REPORT:
AUGUST, 1970

I refer to your 1432/F6/5 of 16th October, 1970.

1. It is a fact that we contribute to the pollution of the environment by using DDT in our tsetse control operations. It is effective in killing tsetse flies at the dosages used; it remains lethal to tsetse flies for three or four months, and it is far cheaper than other effective insecticides.

We have carried out tests on numerous insecticides of widely different chemical composition, and continue to investigate new products as they are produced by the manufacturers. We have not found any group of insecticides more lethal to the tsetse fly or more persistent in their action than the organo-chlorine compounds, dieldrin telodrin, thiodan, DDT and BHC.

The toxicity of telodrin to mammals is far too high for it to be used as a general insecticide. Dieldrin and thiodan, while effective and persistent, are more costly, and more toxic to mammals than DDT. BHC is less persistent than DDT, and therefore less effective under our conditions of application. In all our tests DDT was found to be superior in use to the organo-phosphorus and the carbamide insecticides.

Of the range of commercial insecticides available at the present time there is no satisfactory alternative to DDT for the control of G. morsitans by means of applications of persistent insecticide to the fly's habitat.

There are undoubtedly substances used as insecticides which, in a few days, break down into products less harmful to living things than DDT, but it would be futile to undertake costly and arduous spraying operations against the tsetse fly with an insecticide that was ineffective.

2. The problem of pollution of the environment must be considered realistically and in perspective. If DDT is a serious pollutant in Rhodesia, (and its toxicity to mammals is akin to that of aspirin) then the curb might first be put on those that dispense it most liberally.

For example, DDT is the insecticide of choice for cotton production. The usual rate of application is 1 lb. - 1½ lb. of DDT per acre, 10 to 14 times a season, for as many years as crops are grown. Applications are

made to the foliage and fruits, but much, if not most of the insecticide falls to the ground or is lost in drift. In tsetse control operations, 166½ tons of 75% DDT Wettable Powder were dispensed within the tsetse habitat over 3,496 square miles of infested country in Rhodesia at an average application of 1.80 ounces of para para DDT per acre.

It is usual for there to be only one application ever to an area, but in some years, some areas have received a second treatment. Applications are made to the bark of trees, rot holes in trees, to fallen logs and to holes in the ground, and not to foliage. The risk of poisoning wild life is therefore considered not to be great, and to be negligible compared with general farming practice.

Although the statistics are classified and are not available to me, I have been assured by the Central Statistical Office that the quantity of DDT utilised annually by this Branch is trivial compared with that used in agriculture generally.

3. We have no knowledge of any record that damage to wild life has occurred from a concentration of DDT, or its breakdown products, in animal fats as a result of our insecticide spraying activities. We believe that no such records exist. However, during 1970 some donkeys belonging to this Branch died of unknown causes. They had been grazing for 12 months within the Sebungwe spraying operations area, which had been treated with DDT. Specimens of liver and other organs taken at the post-mortem examination were submitted for analysis for DDT. The Public Analyst reported that "traces of DDT were insignificant", despite the fact that modern gas chromatograph analytical methods are capable of detecting DDT in such minute quantities as one part in ten thousand million. There was thus no evidence of any accumulation of DDT in these donkeys.

4. The contribution made by this Branch to the general pollution of the environment with DDT residues is so slight, and the benefits derived from its use have been so impressive (8,500 square miles have been cleared of tsetse using our combined hunting and spraying operations since 1964) that I can assure you that it would be not in the national interest to restrict the use of DDT in tsetse control operations, until a more effective alternative becomes available.

Gerald F. Cockbill

(G.F. Cockbill)
ASSISTANT DIRECTOR OF VETERINARY SERVICES
(TSETSE AND TRYPANOSOMIASIS CONTROL)

$$\left[\begin{array}{l} 1 \text{ oz} = 28.3495 \text{ gm} \\ 1 \text{ acre} = 0.404686 \text{ hectares} \end{array} \right]$$

$$\begin{aligned} & 200 \text{ tonnes per } 4000 \text{ sq miles} \\ \equiv & 1 \text{ tonne per } 20 \text{ sq miles} \\ \equiv & 1000 \text{ kg per } 20 \times 640 \text{ acres} \\ & \equiv \text{ per } \underline{20 \times 640} \text{ } 259 \text{ hectares} \end{aligned}$$

$$\begin{aligned} & 1000000 \text{ gm per } 20 \times 259 \text{ hectares} \\ & = \text{ per } 5180 \text{ hectares} \\ & = 193.05 \text{ gm of } 75\% \text{ DDT per hectare} \end{aligned}$$

$$\left[1 \text{ oz/acre} = \quad \times 70.053078 \text{ gm/hectare} \right]$$

$$1000 \times 2.2046 \times 16 \text{ oz per } 20 \times 640 \text{ acres}$$

$$\begin{aligned} \equiv & \frac{2204.6 \times 16}{20 \times 640} \text{ oz per acre} \\ & = \frac{35273.6}{12800} \\ & = \underline{2.75575} \text{ oz per acre of } 75\% \text{ DDT wettable powder} \\ & = 193.05 \text{ gm/hectare} \end{aligned}$$

$$\frac{75}{100} \times 193.05 = \underline{144.7875} \text{ gm a.i. per hectare}$$

$$\frac{75}{100} \times 2.75575 = \underline{\underline{2.0668}} \text{ oz a.i. per acre.}$$