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Termite

Identification, Damage and Control Options
in
Southern Province, Zambia

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SHORT TERM CONSULTANCY REPORT ON TERMITE IDENTIFICATION, DAMAGE AND CONTROL OPTIONS IN SOUTHERN PROVINCE, ZAMBIA.

SUBMITTED TO:

LAND MANAGEMENT AND CONSERVATION FARMING (SCAFE)
CHOMA, ZAMBIA.

by

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ABSTRACT

A Pilot diagnostic survey was carried out in Choma, Kalomo districts, Southern Province to identify the major termite pests attacking plantations, fruit trees and crops. Four species were identified as major pests. These were *Allodontermes rhodeosiensis, Macrotermes falciger*, *Microtermes sp.* and *Odontotermes badius*. The study has also shown that, some knowledge of indigenous pesticides exist in the area, and some farmers were using these local pesticides to control termites, with varying degrees of success. The study stresses the need to carry out a more comprehensive study on termite identification, extent of termite damage and indigenous control methods as reflected in the terms of reference in this report.

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INTRODUCTION

This diagnostic Pilot field study was the outcome of the discussion held between Dr. Kebede Tato an advisor in one of the projects under the Soil Conservation and AgroForestry Extension programme (SCAFE) in Southern Province, Zambia. The major objective of the SCAFE programme is to integrate soil conservation and agroforestry into farming systems in Zambia for improved and sustainable production. The main components of agroforestry systems therefore are trees/shrubs, crops, pastures and live stock, together with the environmental factors of climate, soils and land forms (Young , 1984).

Southern province has experienced periods of drought over the years. The high casualty figure (73%) from drought and termites supports the theory that lack of water alone is the most serious threat to seedlings. However, termites in Southern Province are the most serious insect pests which attack growing trees. According to Osteberg, 1993, termites were shown to be responsible for 43% of plant seedlings mortality in Choma and Gwembe districts. The damage extended to field crops (Nkunika, 1989; Nkunika, 1994). This has the negative effect of reducing household food security and lowering of the standard of living for the resource poor small scale farmer, thereby perpetuating poverty.

Under SCAFE Southern Province intends to increase its tree planting efforts of forest and fruit trees as well as leguminous species for livestock feed and soil fertility improvement. Of particular concern will be the intention to introduce on a wide scale, species like *Sesbania sesban*, *Leuceana leucocephala* etc., for fertility improvement and livestock fodder. This exercise can not be cost effective unless the termite threat is redressed. Species selection has been attempted but the farmers interests and their demands can not be ignored (Tato, pers. comm). For example during the 90/91 planting season in Choma/Gwembe districts, the vast majority of tree seedling

recipients (83%) wanted advice and help on management and another strong request (65%) was made for advice and help on using chemicals, especially against termites. As far as the author is aware the use of aldrin and diedrin has been banned leaving the resource poor farmer with no or little alternatives.

In recent times several novel formulations such as Marshal suScon have been developed for use against termites. Technically, the active ingredient in the granular formulation is designed to be released in a two- year period (which is the critical establishment phase of young plants due to termite threat) by a special leaching process dependent upon soil conditions which opens up a micropore structure within granule. Field studies carried out in Zimbabwe have shown that the controlled release carbosulfan (Marshal suScon) can offer an effective and environmentally sound and safe alternative to termite control (Mitchel, 1986). Similar trials have been carried out in Siamambo with equal success (Selander, 1986). Controlled release Marshal suScon products are now regarded as the new control methods for termites in Zambian eucalyptus plantations (Nkunika, 1994). However, these chemicals are very expensive for the resource poor small scale farmer. Hence there is an urgent need to search for alternative options for termite control in the small scale farmers fields.

OBJECTIVES

Following the SCAFE initiatives in Choma and Kalomo districts, it was evident that termites were frustrating the efforts of farmers and technicians. It was therefore imperative to ascertain the severity of the termite problems. Specifically the objectives were;

1. To get a snapshot picture of the termite pest problem by means of collections and identifications.
2. To explore the farmers attempts to solve the termite pest problems using indigenous interventions.
3. To work out terms of reference(ToR) for subsequent studies.
4. To prepare a Project proposal for detailed investigation of the termite problem and possible solutions.

APPROACH/METHODOLOGY

This Pilot study was carried out through discussions with field officers and visits to farmers, Boombe School and women groups engaged in SCAFE programmes. Due to the very limited time available (3 days), the study was confined to Choma and Kalomo districts which fall into agro-ecological zones 1 and 11. The selection ensured that they represented ecological zones- in terms of rainfall, trees/crops grown, soil types, socio-cultural and ethnological groups and settlements. This seemed to be appropriate as the majority of the previous studies were also done in Southern Province.

At the selected point farmers were asked questions and they were in turn asked to express themselves about the termite problems, crops grown, damage caused. The whole interview was a two-way approach. Photographs were taken and termites were collected and preliminary identification at least to genus level was done in the field. Final identification to species level was done in the laboratory. Termites were then stored in 75% alcohol and labelled.

RESULTS.

Termite Species present

A list of identified termite pest species, recorded from Choma and Kalomo districts is given in **Table 1**. and brief notes on their biology and nature of Damage is given below.

Table 1. Termite pest species collected from the farmers' fields in Choma and Kalomo district classified according to their nature of damage and feeding habits.

Species	DISTRICT		Feeding Habits
	CHOMA	KALOMO	
Termitidae			
Macrotermitinae			
Allodontotermes			
A. rhodeosiensis	-	A	R,B,S,W
Macrotermes			
M. falciger	A	A	R,B,S
Microtermes			
M. sp	A,C	-	R,S
Odontotermes			
O.badius	B	-	S,W

Symbols: A Primary attack to health plants

B Secondary attack to health plants

C Primary attack to seedlings

Feeding habits: Root (R) Bark(B) Stem(S)

Drying or Dry wood (W)

Macrotermes falciger

These are the fungus growing mound building termites. These are the most dangerous termite species in plantations (Selander and Bubala, 1983) and crops. All ages of eucalypts, except newly planted seedlings can be killed by this species, attacking the root, bark and stem. This species was collected in both districts. Of particular concern was the damage caused to the Kalomo farmer, where 45% of his maize crop was damaged by this species.

In other demonstration plots losses of 25% - 50% damage due to termites have been reported (Hakayobe - pers.comm).

Microtermes sp.

These are principally wood - feeders but can also consume litter. They have an entirely subterranean nest system composed of fungus combs. They are a primary pest causing all forms of damage. They are also a serious pest of seedlings. In this study they were only collected in Choma.

Odontotermes badius

These species are also fungus growers and build mounds. They can easily be confused with *Macrotermes*. The soldier caste in *Macrotermes* has a white hyline tip, which is lacking in O*dontotermes.* This was a primary pest of eucalypt in Choma, attacking stem, drying wood and poles.

Control methods- indigenous interventions

The overriding recommendation against termites has been the use of Chemicals. However, these are very expensive and out of reach for the poor resource small scale farmer. So at best one can talk of indigenous intervensions.

From the interview with farmers in the Choma and Kalomo districts they used a range of methods to contain the termite problem. These ranged from used engine oil to natural products such as S***warzia madagascariensis.*** The former was used by a farmer in Choma district. This farmer painted the used engine oil onto the trunks of citrus fruits. It is believed that the oil has a repellent effect against termites and black ants.

The use of Muyongola commonly known as snake bean tree ***(Swartzia madagascariensis)*** was widely used in both districts. Farmers asserted that this concoction worked against termites at least for three months. The procedure was repeated again.

Although the active principle has not yet been identified the plant contains saponius which are pesticidal, repellent and toxic to several insect pests especially termites (Malaya and Banda, 1994). Farmers in Kalomo also tried the use of wood ash and the planting of ***Euphorbia tirucalii,*** in the field, common name: Finger euphorbia; Local name: Chisu (Tonga). The active principle in this plant is an alkaloid, euphorben, which is present in the whole plant and acts as a repellent, toxicant and insecticide.

In general farmers were aware of the natural products as termiticides but they were not very confident about their use. These results were preliminary, hence my discussions were limited to very few farmers. It would appear that the local efforts to contain the termite problem are believed to be much wider than what this study shows.

DISCUSSION

This diagnostic study though preliminary has clearly shown that there is a very serious termite problem in Choma and Kalomo districts. The termites are indeed a menace to agroforestry, crops and other related plants and forests consequently damaging the poor economy of the small scale farmer, further. There is strong need for subsequent work on a continuos basis to be extended to other agro-ecological zones.

CONCLUSIONS

1. Further field visits must be carried out over a long period, to increase the sample size.
2. There is need to write a project proposal on a long term basis to adequately follow the agro ecological point of view in addressing the termite problem in Southern Province.
3. The interest of the farmer (new approach) must be the starting point.
4. In line with item 2 and 3 the following terms of reference (ToR) shall obtain;

(i) To identify and document termite species, pests and non pests.

(ii) To identify and document the magnitude of termite damage.

(iii) To document known indigenous methods of termite control, involving community participation, particularly women.

(iv) To analyse and explain how indigenous pesticides work.

(v) To write a report on the findings

(vi) To finally prepare a manual for field workers and farmers as an end product.

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