Integrated Termite Management in degraded crop land in Diga District, Ethiopia

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Introduction

- In Ethiopia, termites are one of the major threats to agricultural crops.
- The problem is severe in the western part of the country.
- several attempts were made to reduce damage caused by termites
- None of these cultural practices are effective.
- baseline study was conducted to understand the relation between the termite problem and land use.
- perceptions and knowledge of termites, the severity of the problem and control strategies.
- Participatory on farm trials were designed to test various options to minimize termite damage and improve soil fertility.

Methods

a. Survey

- The study site, Diga District, Lalisa Dimitu and Bilkila
- For the baseline study, 1^{o} and 2nd data were collected using various tools : KIIs, FGDs, HS

b. On farm trial

- **Design – RCBD**
- **Treatment : Six**
- **Treatments consisted of:**
  - **control(maize only)**
  - **intercrop**
  - **crop residue**
  - **crop residue + intercrop,**
  - **cattle manure,**
  - **cattle manure + intercrop**

- Sorghum Stover: 2t/ha (0.6kg/30m^2)
- Cattle manure: 2t/ha
- DAP= 100 kg/ha
- Urea = 200 kg/ha

Data collection

- Agronomic data
- Soil data
- Termite data
- Socio-economic data

- Farmers evaluation criteria of the trials
  - labor requirement,
    - cost of treatment materials,
    - termite infestation,
    - availability of weed,
    - Grain yield;
    - accessibility of materials
    - overall assessment

Results

Relation between termites, land use, water and livelihoods

- Based on the baseline survey -termite is very serious problem for the last 10 - 15 years.
- Severity increase every year
- Reasons for termite increases
  - Soil degradation(28%)
  - Deforestation(24%)
  - Over grazing(20%)
  - Population pressure(12%)
  - Drought(8%)
  - God(4%)
  - Excess rainfall(3%)

- There is feed shortage
  - termite infestation,
  -land degradation

- Farmers use cattle manure for improving soil fertility.

- decrease in the number of livestock- reduce the amount manure added to soil.
- Less biomass production
- Increases cost of production

- The area receives rain once in a year
  – high in amount
  –high runoff and leaching of bases-
  - Poor infiltration
- recently - Variability in the amount and distribution of the rainfall- affects crop production and productivity,

- affected farm income and household food security
- Reasons for facing food shortage in ranking order
    - poor soil fertility (22%)
    - termite damage (21%)
    - land shortage (12%)
    - oxen shortage (10%)
    - wild animal damage on crops (7%)
- **Farmer perceptions of termites and control methods**
    - Termites damage almost all crops, trees and grazing areas
    - difference in terms of tolerance to termite attack
    - corralling, compost, and manure – soil fertility and reduced termite infestation

- control measures - queen removal, flooding, smoking, and chemicals.

- there are formal and informal institutions that have role in soil, land and termite management.

- termite management is mainly seen as a male activity.
- in terms of the use of manure and crop residues-it is often women who decide.

- hence it important to keep these gender aspects into account when designing interventions.

Testing the effect of crop residues and cattle manure

- High significant differences (P<0.01) - days to maturity, and grain yield of maize.

application of crop residue and cattle manure

- % OM content of the soil by 13.9 and 24.5%.
- Grain yield by 16.7 and 38.8%.
- days to maturity by 16.4 and 22.0% .
- reduces the number of termites, by 21.6 and 29.7% compared to the control treatment

Treatment	% OM	Days to Maturity	GY (t/ha)	Termite count/plant
1. Control	6.92	98.70	5.66	37
2. M+IN	7.20	112.0	7.03	**40**
3. M+CR	7.83	113.8	6.02	23
4. M+CR+IN	8.25	122.5	7.57	35
5. M+CM	**9.70**	121.3	**9.58**	**20**
6. M+CM+IN	8.67	**131.8**	8.92	32
Mean	8.09	116.7	7.50	31.2
LSD	1.74	20.7	1.68	NS

- Termites were observed at maturity- soils dry up.
- Based on farmer's evaluation criteria's-farmers ranked the trials:
  - cattle manure + intercropping
  - crop residue + intercropping,
  - cattle manure,
  - intercropping,
  - crop residue and
  - control

Conclusions and Recommendations

- Termites are symptoms of land degradation and poor soil fertility.
- To address this, we need to address the underlying factors.

- The issue of cause and effect is not clear to people and extension workers.- requires capacity building

- added value of 'feed'- better management of grazing –more cattle-more manure- improve fertility- higher crop productivity-more crop residue- reduce termite infestation-low cost of production.

- Adding cattle manure and crop residue not only adds additional organic matter to the soil but also provides feed for the termites and diverts their attention.

Thank you!