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Soil Fertility Consortium for Southern Africa
SOFECSA

Contextualization of agroecology in Zimbabwe

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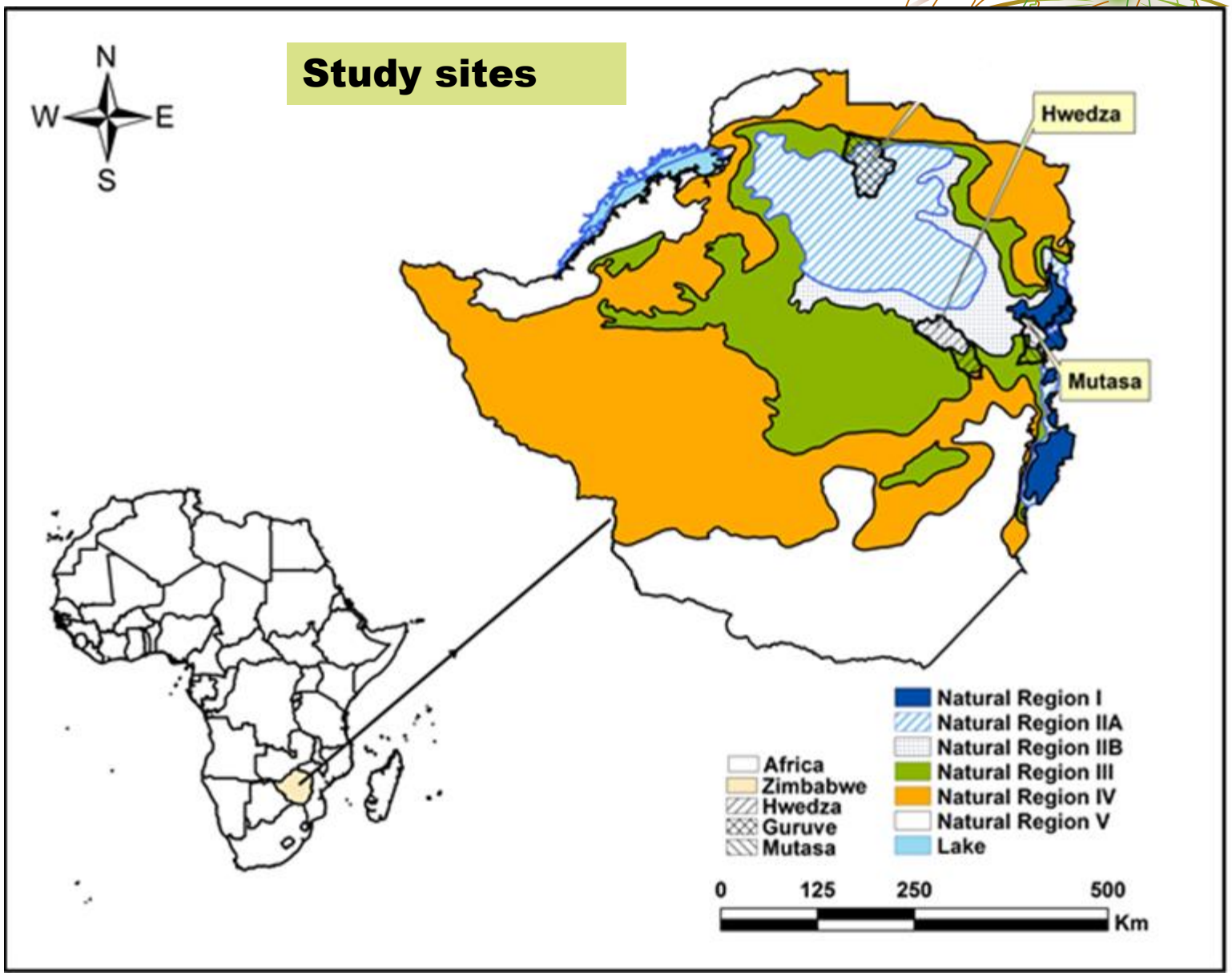
Background

- Agriculture remains the backbone underpinning livelihoods of many
- Heterogenous farming units divided into:
  1. Large scale commercial farms
  2. Small-to-medium scale
  3. Communal (smallholder farmers: >70% of farmers)
- Majority of food produced by smallholder farmers often owning < 2 ha of land

Background …

- Smallholder crop production is under rainfed conditions in a unimodal season between Nov - Mar
  - High rainfall areas NR 1 receive >1000 mm yr^{-1} while the least get <450 mm yr^{-1} (NR5).
  - Prime cropping of staple maize is in NR 2 & 3 receiving between 650-800 mm yr^{-1}
- Farming generally based on indigenous/ local knowledge & practices that have evolved over many generations.

Zimbabwe natural regions



Crop production in Zimbabwe

- Women are major agricultural producers (>80%) but most of the land is owned by men
- Crop production is mainly subsistence and little surplus often marketed
- Use of locally available resources widespread with minimal use of little external inputs
  - Sustainable to a great extent

Crop production in Zimbabwe

- Maize (or corn) (*Zea mays*) is the staple crop grown in:
  - Monocrops or
  - Rotated or intercropped with a grain legume e.g. cowpea (*Vigna unguiculata*); groundnut (*Arachis hypogaea* or bambara nut (*Vigna subterranea*)

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Constraints to smallholder agricultural production

1: Poor & declining soil fertility/ Degraded soils: negatively affecting staple food production

Old & highly weathered soils typify the African landscape

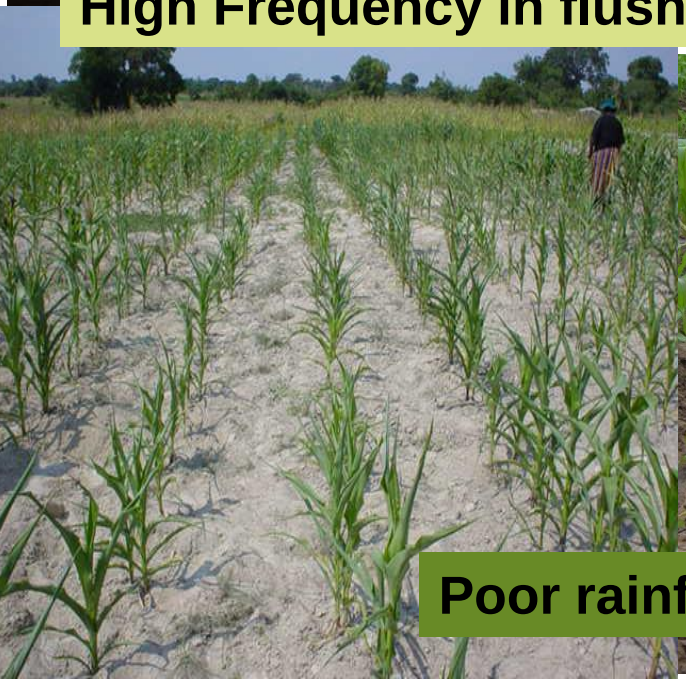
1b - Many smallholders derive their livelihoods from cultivation of inherently fragile ecosystems characterized by highly weathered soils, inherently infertile soils, steep slopes

2. Persistently **high costs and non-availability of fertilizers** against unfavourable prices of agricultural produce and **Poor quality and quantity** of available **organic nutrient resources**

3. Increasing climate variability and change

High Frequency in flush floods

High frequency of hail storms



Poor rainfall distribution within the same season

4. Maize dependency syndrome… “Maize poverty trap”

Maize… but challenging soils

Maize … despite input and labour investments

Maize…fertility gradients common

5. Pest and diseases

Variations in weather and climate now increasing incidences of pest and disease infestations to field crops

Others ....

7. Land ownership
8. Inappropriate land use coupled with unsuitable management practices
9. Multiple underlying stress factors associated with
   - poverty
   - lack of knowledge,
   - lack of basic livelihood assets/access to resource entitlements
   - limited access to services and markets

What does this all mean?

- The majority of communities depend directly on their own agricultural production systems for FSN

  →***implying that they can only eat what they produce.***

- For the smallholder farmer, failures in agriculture imply:
  - Food and nutrition insecurity
  - Income insecurity
  - Threats to natural environment (land degradation; encroachment of marginal lands; pollution, etc.)
  - Over-exploitation of natural resources
  - Socio-political instability

What do we see at the end of the trajectory?

- Declining per capita agricultural production,
- Diminishing natural resource base
- loss of agro-biodiversity and crop/varietal choices deepening problems of FSN
- Land degradation – smallholder farming is the major cause of deforestation
- Low-income opportunities
- Chronic malnutrition, especially among women & children.
  - Farming families have commonly been reported to face 3-5 hunger months in a year

New opportunities for resilience building

- Need practices which focus on successful agricultural production
  - while maintaining the quality of the environment and conserving the natural resource base.
- Practices such as:
  - Agroecology

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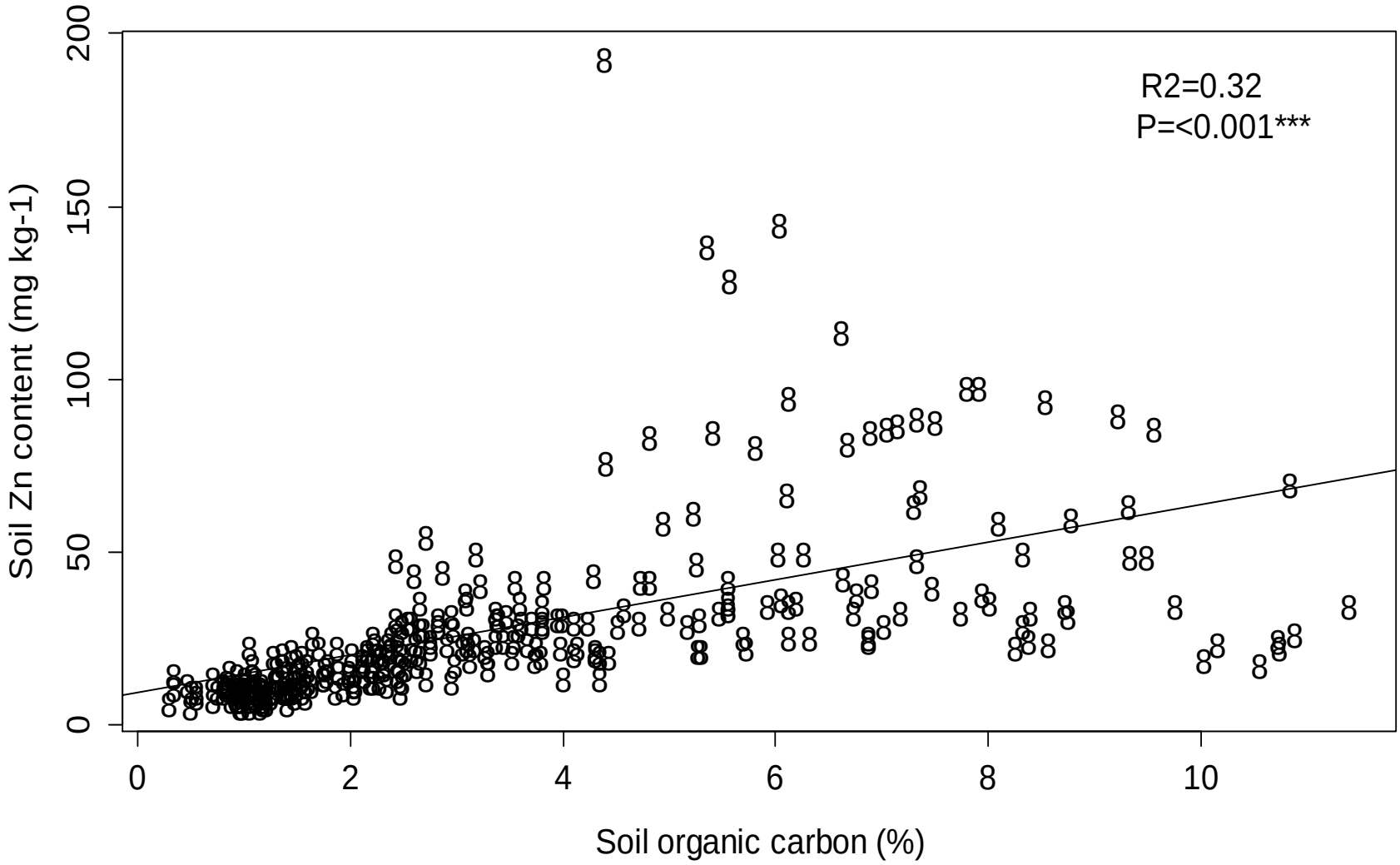
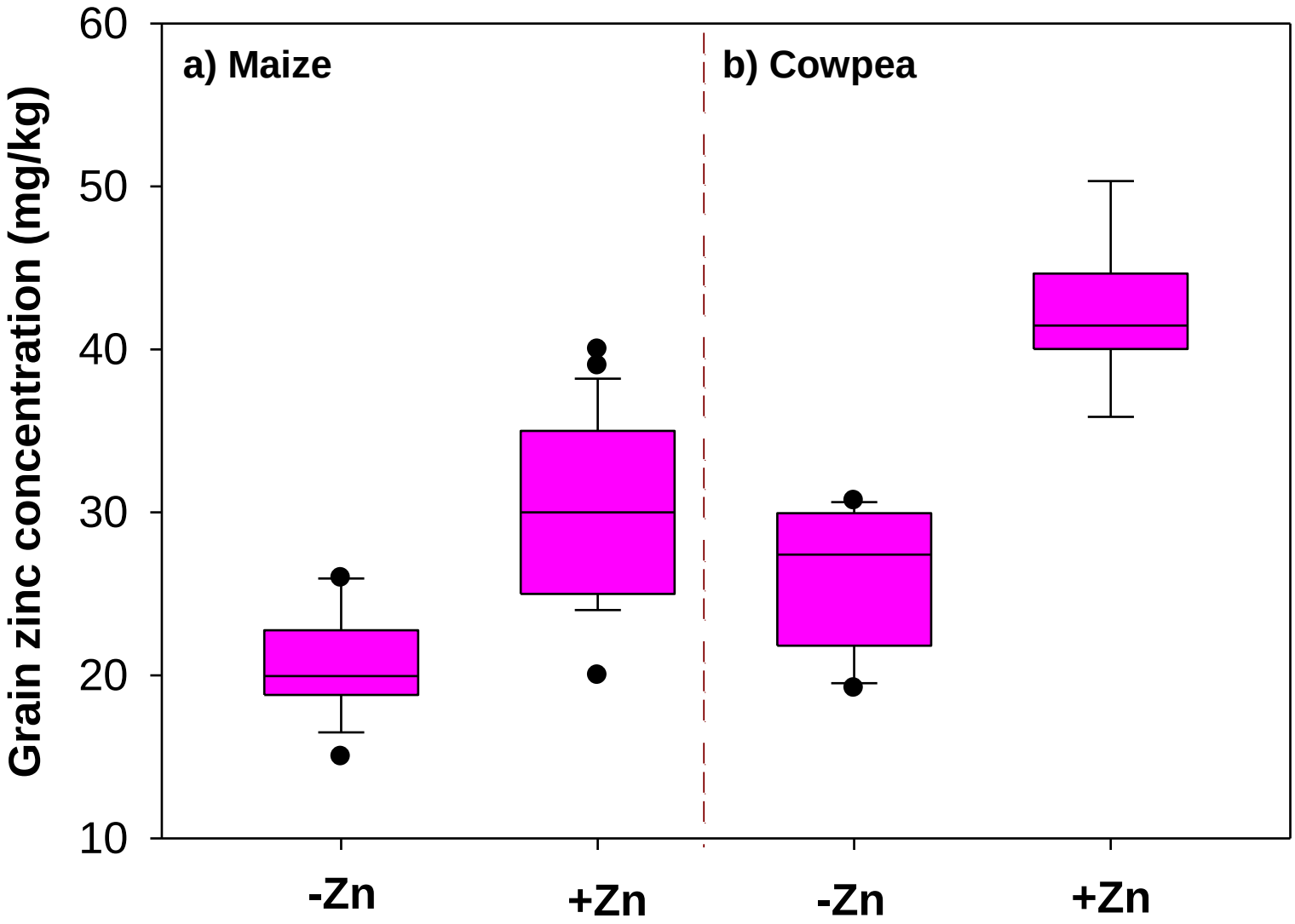
Influence of organic nutrient use on soil Zn



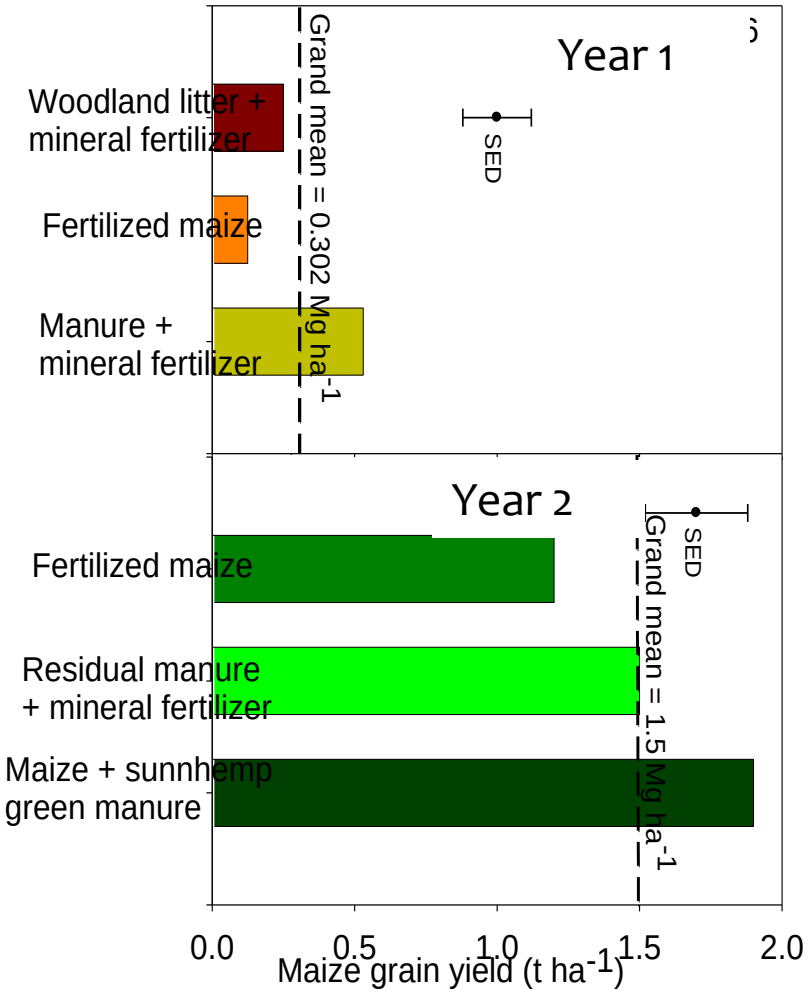
Manzeke et al. in prep

Zn benefits in legume-cereal cropping

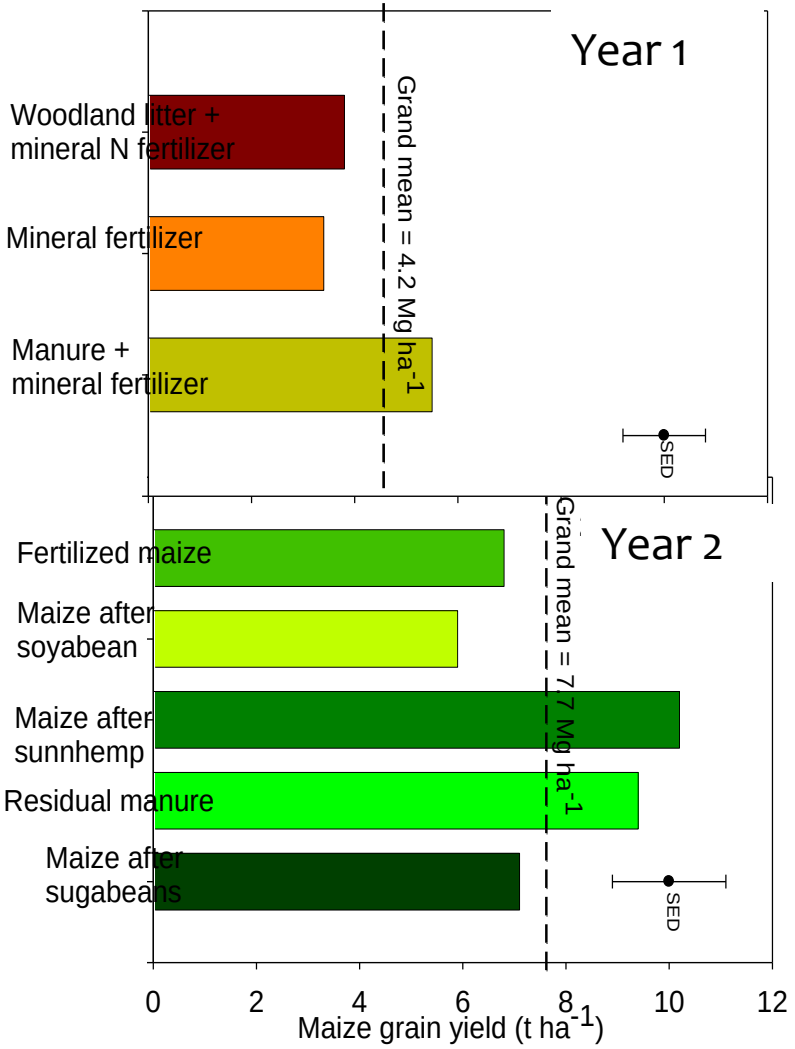


Manzeke et al. in prep

Host farmer = Resource-constrained



Host farmer = Resource-endowed



Place of AE

- The agroecological practice culminates in the concept of sustainable and climate resilient agricultural practices
- In general, AE:
  - can stabilize yields
  - has a positive impact on the environment
  - is inclusive and gender sensitive
  - incorporates diversity
  - Uses local resources
  - promotes self-organization by affected communities
  - is replicable and scalable.

Key ingredients to AE success

- Agricultural transformation must be accomplished without depletion of the natural resource base. As such there is need to enhance:
  - Access to technical and climate information
  - Integration and sharing of local and indigenous knowledge, upon which decisions are made
  - Access to:
    - Information and knowledge exchange platforms
    - learning platforms and matching extension approaches (e.g. Farmer Learning Centre approach – FLC)

I thank you