Conservation Farming and Yields
Response to Spatial and Temporal effects in Zambia

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Outline

1. Introduction
2. Background
3. Research questions
   - Methods
   - Preliminary results
   - Plans ahead
Background - Zambia

- **Climatic conditions**
  - Unimodal rainfall from November to March (erratic and unreliable)
  - Mean Annual Temperature $24^\circ C$

- **Soils**
  - Alfisols, Ultisols, Vertisols

- **Declining soil fertility and low nutrient levels**

- **Crop performance varies across different bio-physical conditions**

- **Majority are small holder farmers (<2ha) on communal land tenure system**
Traditional Farming (Chitemene system)
Traditional Farming
Conservation Agriculture/Farming

- Global principles: minimum tillage, permanent land cover, and crop rotation with legume
Hand Hoe CF as Proposed in Zambia

- Dry season/early land preparation using minimum tillage methods (hand-hoe) laid out in precise grid of 15,850 pot holes per hectare

- Reduced tillage (basins or pot holes)

- Retention of crop residues no burning

- Crop rotation with 30% nitrogen-fixing crops

- Addition of compost, manure
Seasonal Calendar and Critical Events
Motivation
Goal

To examine environmental variables affecting crop yield under conservation farming
Overarching Questions of the Study
Specific Research Questions
Materials and Methods: Study Site
Zambia
Experimental Design
Sampling and Analysis
Landscape Position Calculations
Specific Research Questions
Research Question 2
Improved Conservation Farming Practices
Hypotheses
Materials and methods
Analysis
Crop yield (grain yield, total biomass)
Specific Research Questions
Method: Study site
Field Sampling
Analysis
Comparison of 2 Digital Elevation Models
Rainfall data - farmers, and CRU
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Questions
Land Use