CONSERVATION AGRICULTURE: TOWARDS ACHIEVING FOOD SECURITY AMONG RURAL SMALLHOLDER COMMUNITIES

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Outline

- Background
- Objectives
- Methodology
- Results and discussion
- Conclusions
- Acknowledgements

Background

- In South Africa, smallholder farming is characterised by use of inappropriate farming practices, lack of farming skills and degradation of arable land which result in low crop productivity and food insecurity
- These challenges are exacerbated by climate change
- Change in temperature and rainfall patterns have a great impact on agricultural production
- Rain-fed agricultural production systems are vulnerable to seasonal variability which affects the livelihood outcomes of farmers who depend on this system of agricultural production
- To address the above mentioned challenges, the Department of Agriculture, Forestry and Fisheries (DAFF) introduced a LandCare programme

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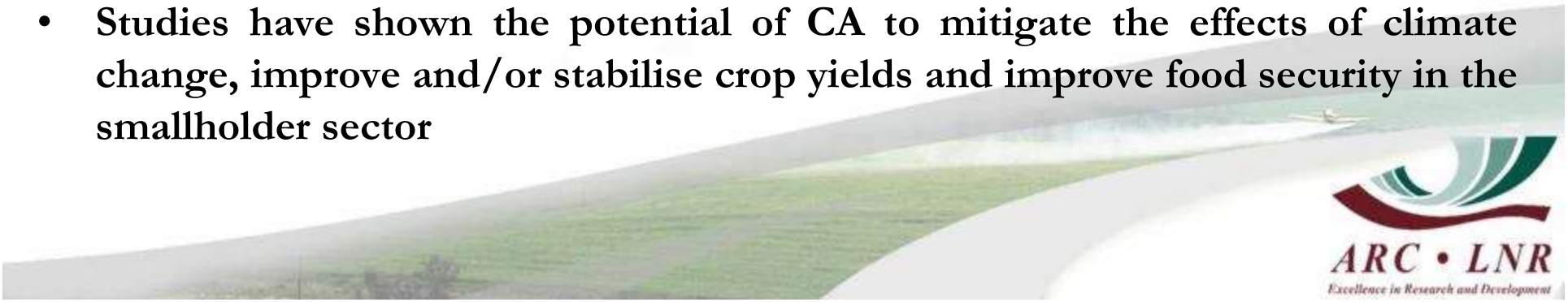
Background Cont…

- In support of the LandCare programme, the DRDLR: TRD collaborated with the ARC-SCW to initiate Conservation Agriculture Technologies (CATs) projects in three communities of the Eastern Cape Province
- These communities all faced challenges relating to declining soil fertility and degradation of ecosystem services
- Technologies for sustainable agricultural intensification were then identified for piloting and assessment in community farms
- Conservation agriculture (CA) is a concept for resource-efficient agricultural crop production based on three principles:
  - ✓ Minimum mechanical soil disturbance
  - ✓ Permanent soil cover
  - ✓ Crop rotation or diversification
- Studies have shown the potential of CA to mitigate the effects of climate change, improve and/or stabilise crop yields and improve food security in the smallholder sector



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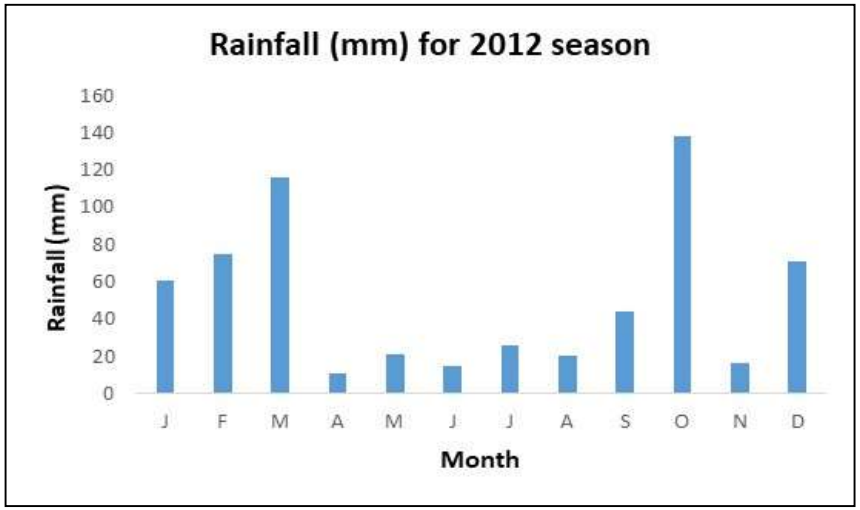
Objectives

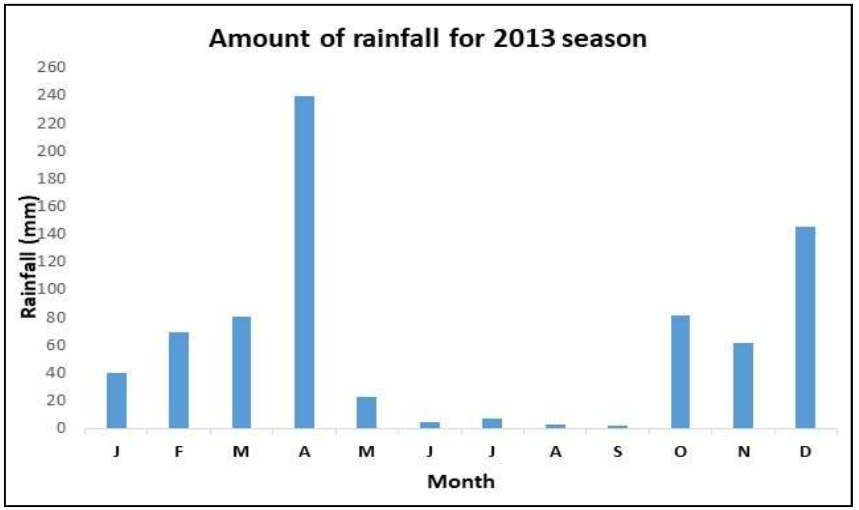
- **To demonstrate and asses CA to improve communities' production systems and sustainable livelihoods**
- **To evaluate the agro-ecological impact of CA on soil quality and crop yield**

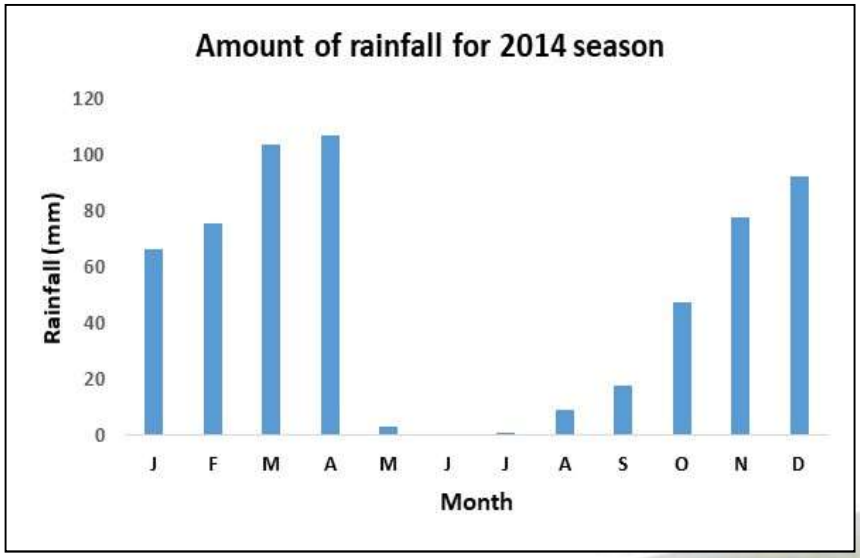
Methodology

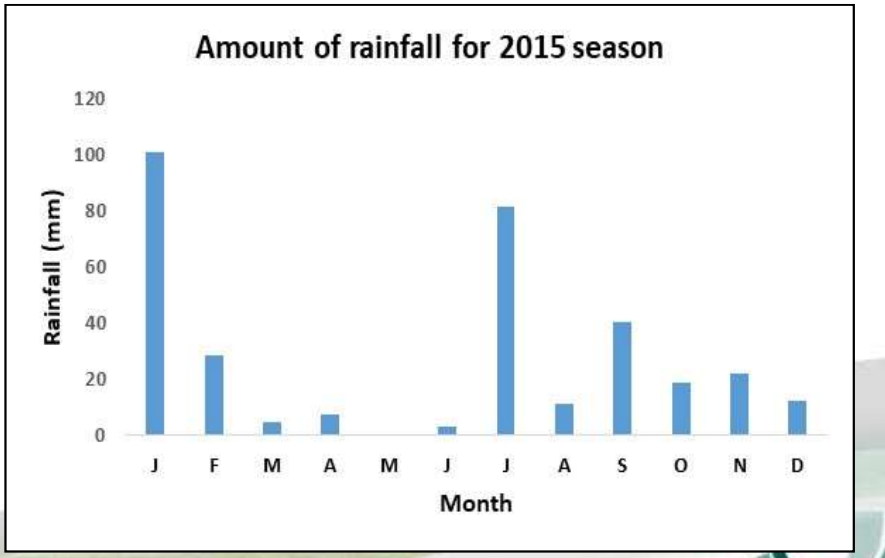
- **Conservation Agriculture Technologies (CATs) projects implemented in the three study areas of the Eastern Cape province from 2012 to 2015**
- **Study areas located 53 km south-west of the town of Mthatha**
  - ✓ **Mvezo village:** 31° 57' 10.08" S and 28° 29' 08.88" E
  - ✓ **Candu:** 31° 56'S and 28° 26'E
  - ✓ **Ludondolo:** 31° 56' 25.54" S and 28° 28' 30.76" E
- **The long-term average annual rainfall is 744.0 mm, of which 563.6 mm, or 75.8%, falls from October to March**
- **Temperatures vary from an average monthly maximum and minimum of 26.6 °C and 15.5 °C**

Rainfall data









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Methodology Cont…

- Two types of trials (Collaborative (CMT) and farmer-managed (FMT))
- Treatments at CMT
  - ✓ Control- Maize
  - ✓ Conventional maize
  - ✓ CA maize
  - ✓ CA intercropping (maize and dry bean)
  - ✓ CA maize/dry beans/maize
- The field study was laid out in a randomized complete block design
- Four replications
- Crop cultivars: Dry beans: kranskop cultivar; and yellow maize: Okavango
- Yield
  - ✓ Maize
  - ✓ Dry beans
- Experimental treatments analyzed by ANOVA
- LSD calculated at 5 % level

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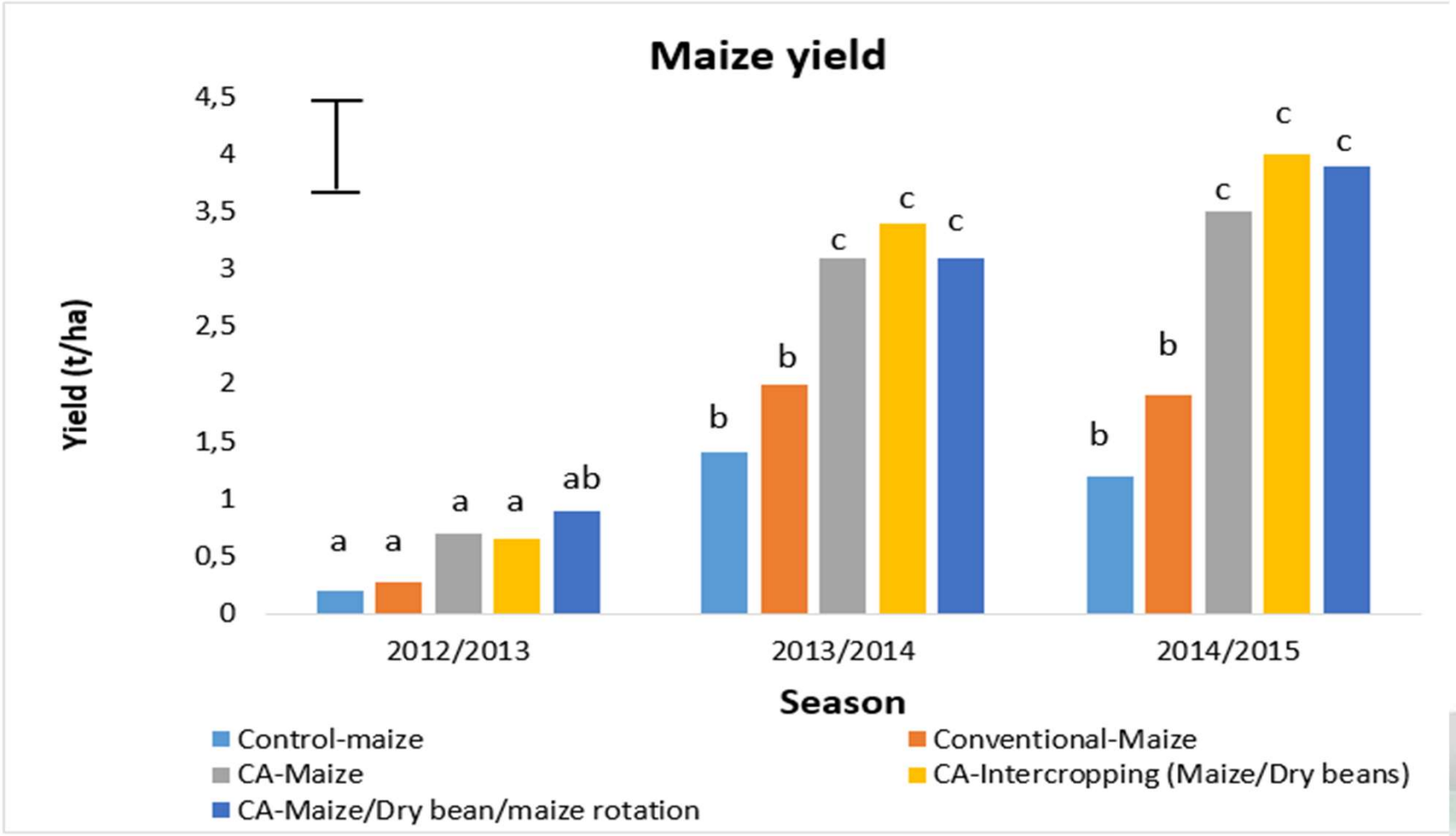
Results and discussion



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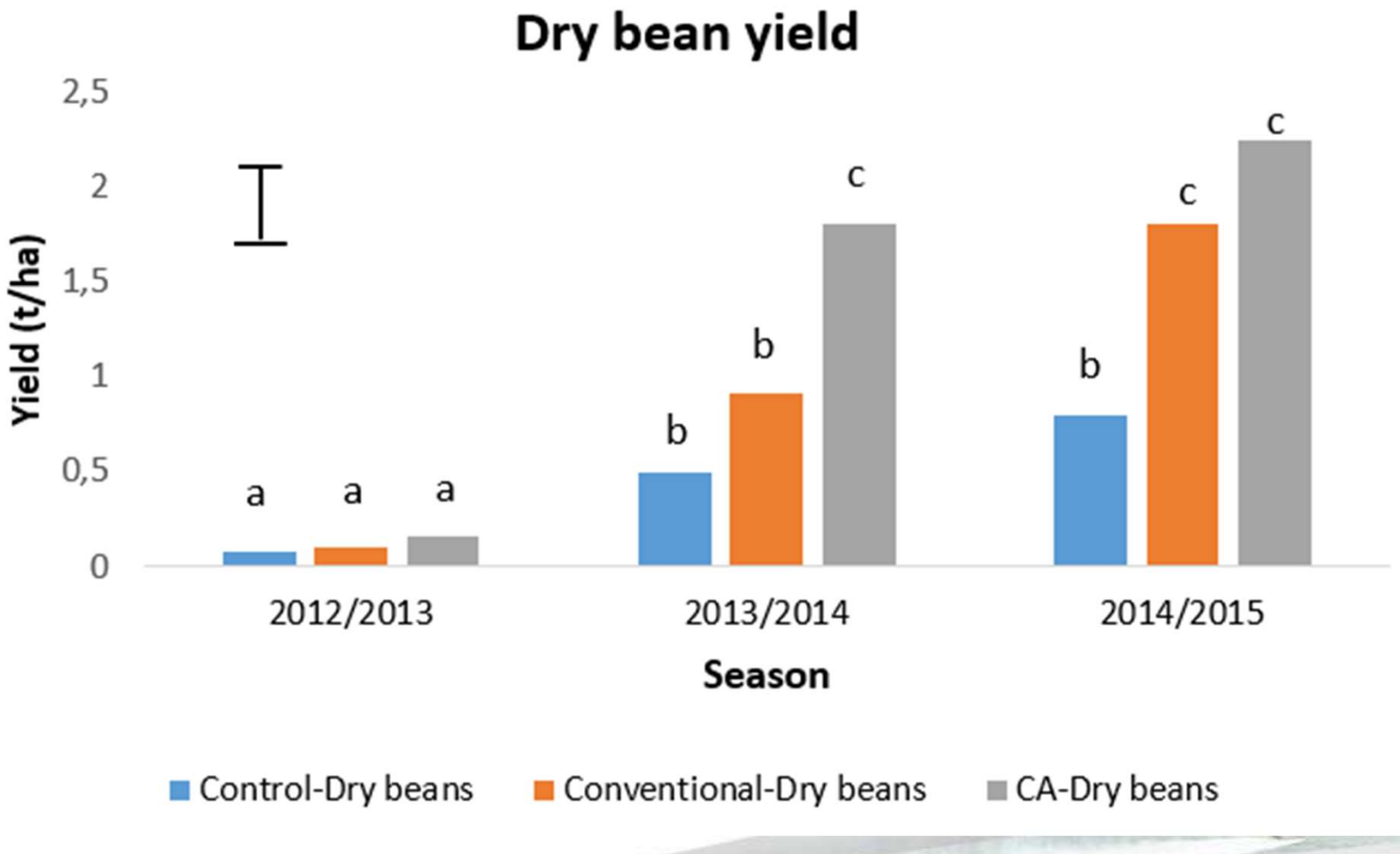
Results and discussion



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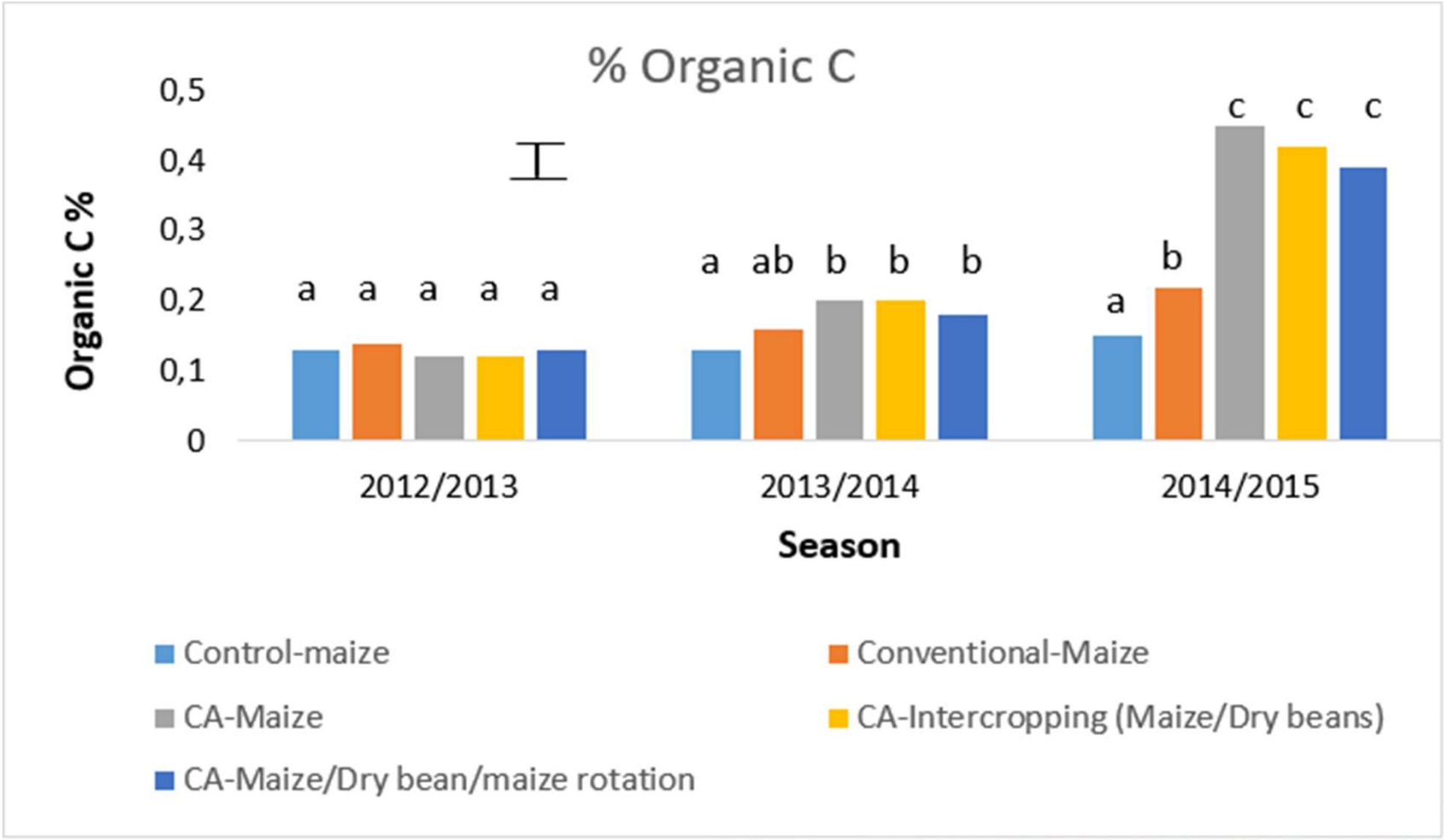
Results and discussion



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Results and discussion

- The farmer-led experimentation provided farmers with an opportunity to test and adopt technologies
- Participatory on-farm experimentation provided farmers with an opportunity to evaluate crop response
- Farmers observed significant differences between CA and conventional tillage trials
- Maize yield improved by 40% in the first season under CA compared to conventional tillage

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Conclusions

- Increased water retention on CA fields improved the resilience against seasonal dry spells and therefore reduced the risk of crop failure for smallholder farmers in the three study areas
- CA has the potential to significantly increase yields and agricultural productivity in a sustainable manner even for poorly resourced farmers resulting in improved food security
- The CATs projects had a significant impact in a short period of time. This also laid a foundation for sustainable development, and provided valuable lessons for the South African farming sector in poor rural communities.
- Sustainable agricultural practices, especially mainstreaming CA in small-scale farming sector to address household food insecurity and climate change effect could serve as catalyst for achieving rural economic transformation

Acknowledgements

- Department of Rural Development and Land Reform
- Communities of Mvezo, Candu and Ludondolo villages
- Mbashe and KSD Local Municipalities
- Eastern Cape Department of Rural Development and Agrarian Reform

Thank You