Climatic risk analysis in conservation agriculture under varied biophysical and socio-economic settings of Southern Africa

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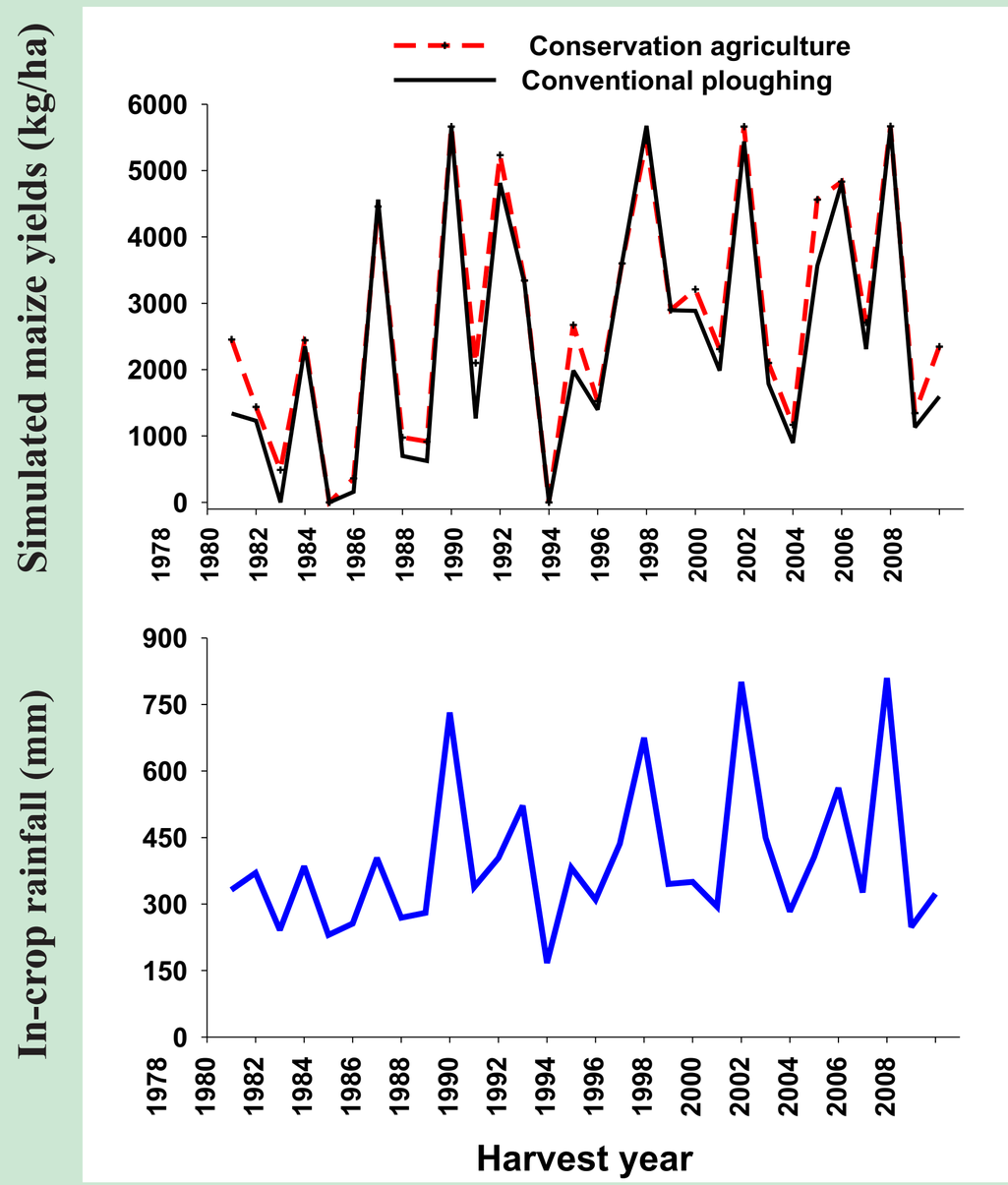
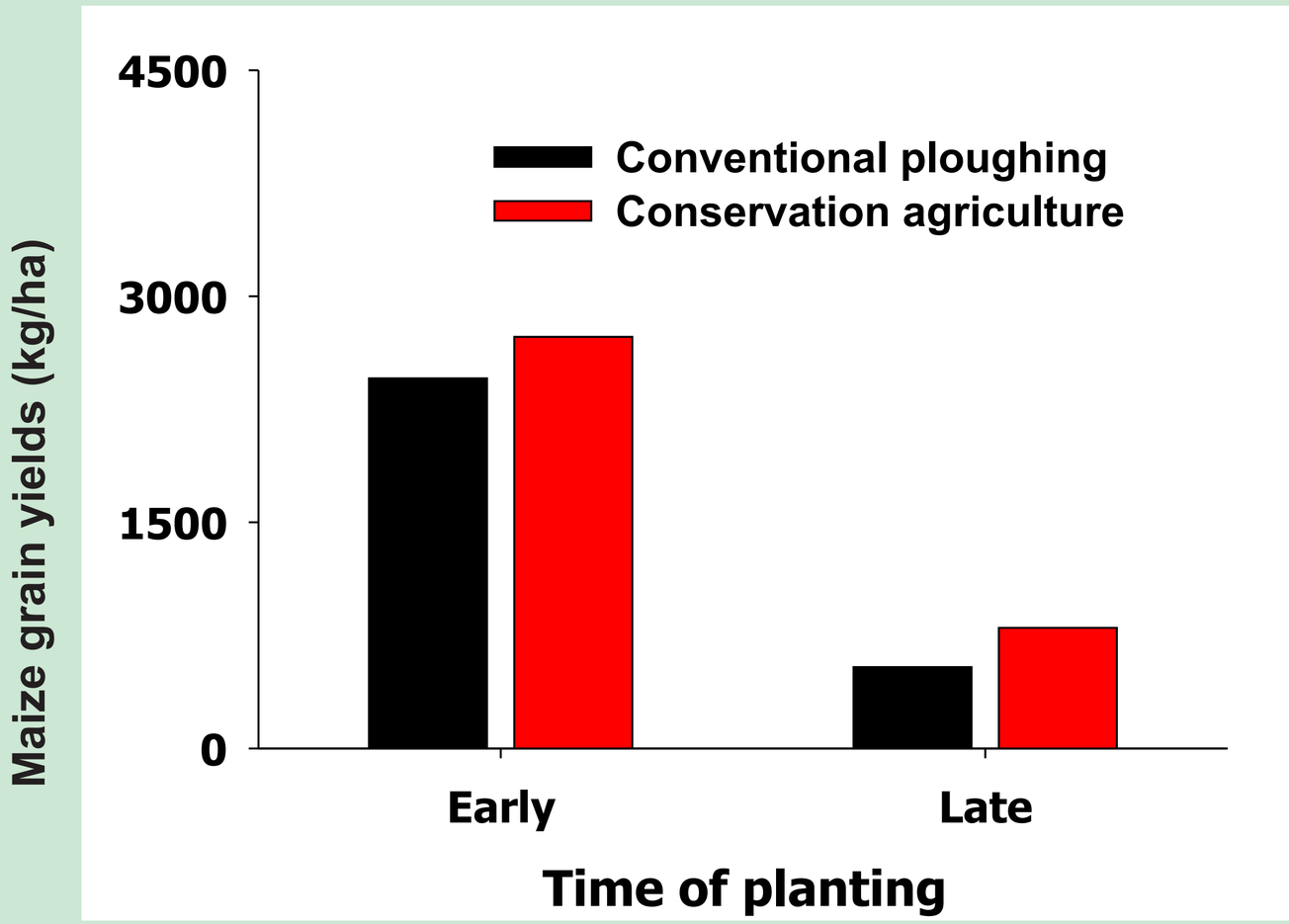
Introduction

- Climate change and variability is a phenomena that is negatively affecting livelihoods, straining the utility of limited resources that smallholder farming households can access
- Recurrent mid-season dry spells and droughts require that crop production practices are tailored to suppress the expression of the associated negative impacts

The research approach: The study sought to trace how CA has been implemented in southern Africa and define the niches where returns to investment are worthwhile for smallholder farmers under a changing climate and climate variability. This involved interacting with farmers, extension, researchers, development agencies, meteorological service providers and members of national CA task-forces in South Africa, Zambia and Zimbabwe. The key guiding question was on how CA could be appropriately packaged to reduce climatic risk, in the face of large crop losses linked to soil moisture deficits. Simulation modelling with two sets of long term climatic data was used to evaluate performance of CA and conventional ploughing on maize productivity under similar management level (fertilization, time of planting) and on two broad soil types.

Standing on 'perfect' conditions - Researchers marvel as a Gauteng farmer explains the wonders of CA in a semi arid environment





Results and conclusions

- The study revealed phenomenal variability in performance of maize across seasons highlighting pending challenges associated with accelerated climate change and variability (Figure above)
- Under similar management there are only marginal differences between CA and conventional ploughing when crops are planted early, with clear huge benefits associated with early planting (Left figure)
- Poor project designs and subsequent reporting of results by different players implementing CA has tended to overplay CA benefits (and downplaying other alternative technical options available to the smallholder farmers under similar investments)
- More adaptive research needed to provide empirical evidence on CA performance in the region

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