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ClimDev-Africa

SIMULATING CLIMATE CHANGE EFFECTS ON MAIZE GROWTH & YIELD UNDER SEMI-ARID CONDITIONS IN ZIMBABWE

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Problem statement

- Climate is changing (IPCC, 2013)
- Agriculture is affected (T^oC, Rainfall, CO_2)
- For Africa- crop yields projected to decrease (IPCC, 2014; Schlenker &Lobell, 2010)
- African communities are among the most vulnerable (IPCC 2007; Barrios 2010)

Objectives

To simulate the effects of climate change on:

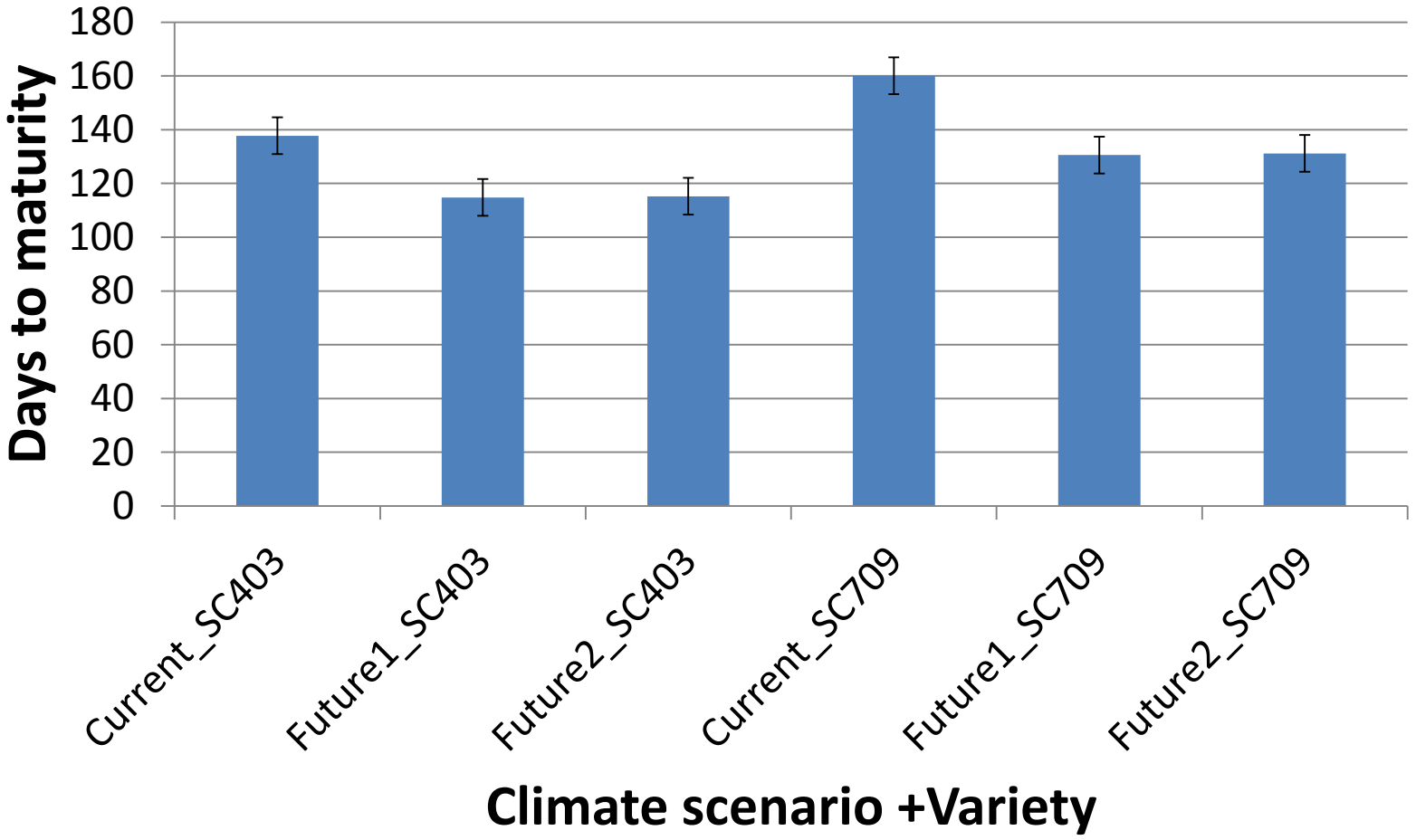
- Days to physiological maturity of an early (SC403) and late (SC709) maturing maize varieties
- Grain and stover yield of SC403 and SC709 maize varieties,

grown under a sandy soil and under smallholder farmer management practices

Materials & Methods

- Agricultural Production systems SIMulator - APSIM (model) –Daily Tmax, Tmin, Srad, rainfall.
- Composite met file –Thornhill Station
- CC Scenario –A2 emission Scenario (2 future climates vs current) –IPCC, 2007 (describe)
- Simulation done without adaptation & CO_2 factored in

Key Findings



Key Findings

- Probability that grain & stover yield do not exceed a given yield higher under CC.

Grain yield: 14-16% lower for both varieties under climate change (though not sign.)

Stover yield :

- 13% lower under CC for early variety(non-sign.)
- 20% lower under CC for late variety (signif.)

Conclusions/Recommendations

- CC reduces the number of days for Dry Matter accumulation.
- Potential benefits of CO_2 fertilization seem to be offset by reduced rainfall & increased T^oC
- Appropriate adaptation strategies needed *(e.g.)*
- Future research to consider other possibleclimate and agronomic scenarios *in simulating CC effects*