

# Adaptation strategies to climate change for summer crops on Andalusia: Evaluation for extreme maximum temperatures

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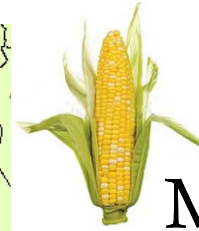
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Evaluate a set of agricultural adaptation strategies to cope with climate change impacts, with focus on the consequences of extreme events on the adaptations proposed in the semi-arid environment of Andalusia (Southern Spain)

- **Experimental, soil and management data** (Andalusia Network of Agricultural Trials: RAEA).



Maize irrigated  
Cultivar Helen  
(FAO 700)

- **Climate data: daily Tmax, Tmin, Precip, Radiation**

**PRESENT-BASELINE**

1981-2010

- Agroclimatic Information Network of Andalusia (RIA)
- ERA-Interim

**PRESENT AND FUTURE  
CLIMATE SIMULATIONS  
(12-14 RCM)**

- ENSEMBLES project (<http://www.ensembles-eu.org/>)
- Bias corrected (Dosio and Paruolo 2011, and Dosio et al. 2012)

- **CALIBRATION:** Genetic coefficients, potential yield
- **VALIDATION:** Independent data

	CALIBRATION		VALIDATION	
	RMSE	MPE (%)	RMSE	MPE (%)
Anthesis (das)	3.1	4.2	5.6	7.2
Yield (kg ha <sup>-1</sup> )	344	2	1456.8	9

CERES-Maize crop model  
(DSSAT v. 4.5 platform)

**-Evaluation of climate ensembles (control period 1981-2010)**  
**IMPACT SIMULATION**  
**-Impact for 2021-2050 and 2071-2100**

**ADAPTATIONS PROPOSED**

**EXTREME EVENTS**

## Adaptation strategies

### Earlier sowing date

- 15 days-step

### Cultivar change

- Increasing thermal time
- Increasing grain filling rate

### Combination

- Earlier sowing date and cultivar change

## Extreme events

35°C 1d, 35°C 5d

### YEAR

- January -December

### FLO

- 7 days before anthesis to 7 days after

### LAG

- anthesis to 7 days after

### GRAIN

- 7 days after anthesis to maturity

1.Aim

2.Data

3.Methods

4.Results

5.Conclusion

Results: Publication in progress



- ✓ Increased quality of projections and reduced uncertainty by
  - ✓ Site specific assessment
  - ✓ Local evaluation of climate data
- ✓ Locally addressed adaptation in Andalusia
  - ✓ May compensate maize yields
    - ✓ Earlier sowing dates and cultivar changes
  - ✓ Extreme events may limit adaptation in Granada
  
- ✓ Crop models has to be improved for simulating the effect of extreme events for a better quantification!!



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# Thank you

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