Simulation of climate change impact on weeds distribution. Studying the case of wild oat in Greece.

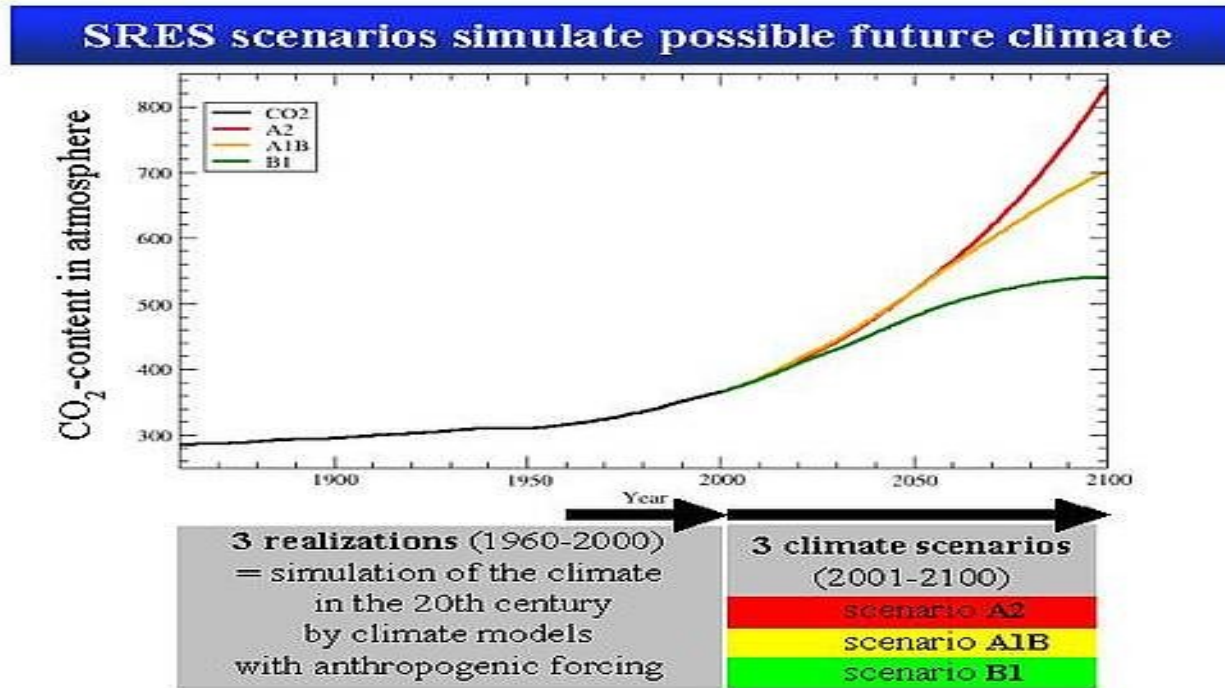**D.S. Voloudakis, V.E. Kotoulas, I.S. Travlos, G.K. Economou and A.J. Karamanos.**

Laboratory of Agronomy, Agricultural University of Athens, 75 Iera Odos, 11855 Athens, Greece.

INTRODUCTION

Climate change factors affecting agricultural production

·Rise of CO_2 concentration

·Higher temperatures

·Altered precipitation and transpiration regimes

·Increasing intensity and frequency of extreme climatic events

·Changes in **_weed_**, pest and pathogen pressure

·Changes in water resources

·Loss of crop land

·Changes in crop productivity period

·Uncertainties in appropriate time and crop species

·Impacts on food resources, rise of food prices, higher intensity in hunger problems

Κάντε κλικ για να επεξεργαστείτε τον υπότιτλο του υποδείγματος

Climate change basic scenarios

SRES scenarios simulate possible future climate

SCENARIOS	A1B		A2		B2	
TIME PERIOD	2041-2050	2091-2100	2041-2050	2091-2100	2041-2050	2091-2100
CO_2	+40%	+89%	+40%	+125%	++26%	63%
Temperature	+1,95⁰C	+3,5⁰C	+2⁰C	+4,5⁰C	+1,98⁰C	+3,1⁰C

methodology

- Establishment of a field experiment in A.U.A. to evaluate the effect of certain climatic parameters on oat growth.

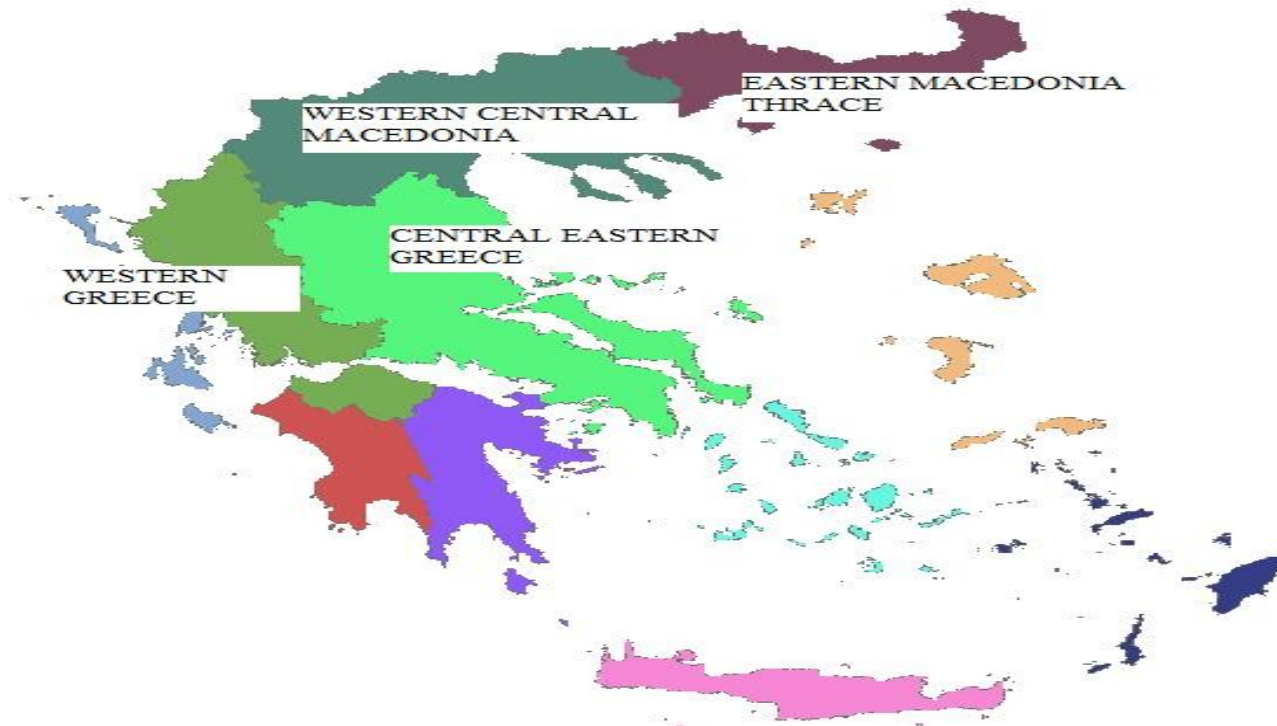

- Phenological and physiological observations.

- Use of AquaCrop model to simulate the weed growth procedure.

methodology

- Selection of four areas in Greece with high agronomic interest.

methodology

- Parameters to be calibrated
- Biomass (Mg ha-1), Yield (Mg ha-1), Canopy Cover (%).

$$\text{RMSE} = \sqrt{\frac{1}{n}\sum_{i=1}^{n}(S_i - O_i)^2}$$

$$\text{ME} = \frac{\sum_{i=1}^{n}(O_i - MO)^2 - \sum_{i=1}^{n}(S_i - O_i)^2}{\sum_{i=1}^{n}(O_i - MO)^2}$$

Preliminary results

Wild oat	Biomass	Yield	Best fit of the model
ME	0.49	0.67	1
RMSE	0.26	0.17	0

	2050's		2100's	
	without CO_2	with CO_2	without CO_2	with CO_2
A1B	-7%	13%	1%	25%
A2	-5%	32%	-4%	51%
B2	1%	49%	-3%	80%

Thank you