



# ABSTRACT BOOK

International Conference on



The Way of Farming for 21<sup>st</sup> Century

**October 8-9, 2018 MNS-UAM**

Organized by:

**Department of Agronomy**

Faculty of Agriculture & Environmental Sciences

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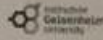
International Conference on Climate Smart Agriculture: the Way of Farming for 21<sup>st</sup> Century  
October 08-09, 2018  
Department of Agronomy, MNS University of Agriculture, Multan, Pakistan



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## Interactive effect of elevated carbon dioxide, magnesium deficiency and drought stress on wheat

Muhammad Asif, Levent Ozturk

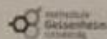
Faculty of Engineering and Natural Sciences, Sabanci University, Istanbul, Turkey

\*Corresponding author: masif@sabanciuniv.edu

Elevated carbon dioxide (CO<sub>2</sub>) and drought stress are two of important phenomenon of climate change. Elevated CO<sub>2</sub> increases photosynthetic efficiency of plants especially C<sub>3</sub> species and ameliorates the adverse effects of drought stress. Magnesium (Mg) being central atom of chlorophyll molecule is very important for maintenance of photosynthesis it is very critical to reveal the effect of elevated CO<sub>2</sub> and drought on Mg nutrition of plants. This study was aimed at investigating the interactive effect of elevated CO<sub>2</sub>, drought and magnesium deficiency on photosynthetic parameters, biomass formation of wheat.

Bread wheat (*Triticum aestivum* cv. adana-99) seeds were sown in pots containing acidic soil provided with either adequate Mg or low Mg in identical climate chambers provided with either ambient (400  $\mu\text{mol mol}^{-1}$ ) or

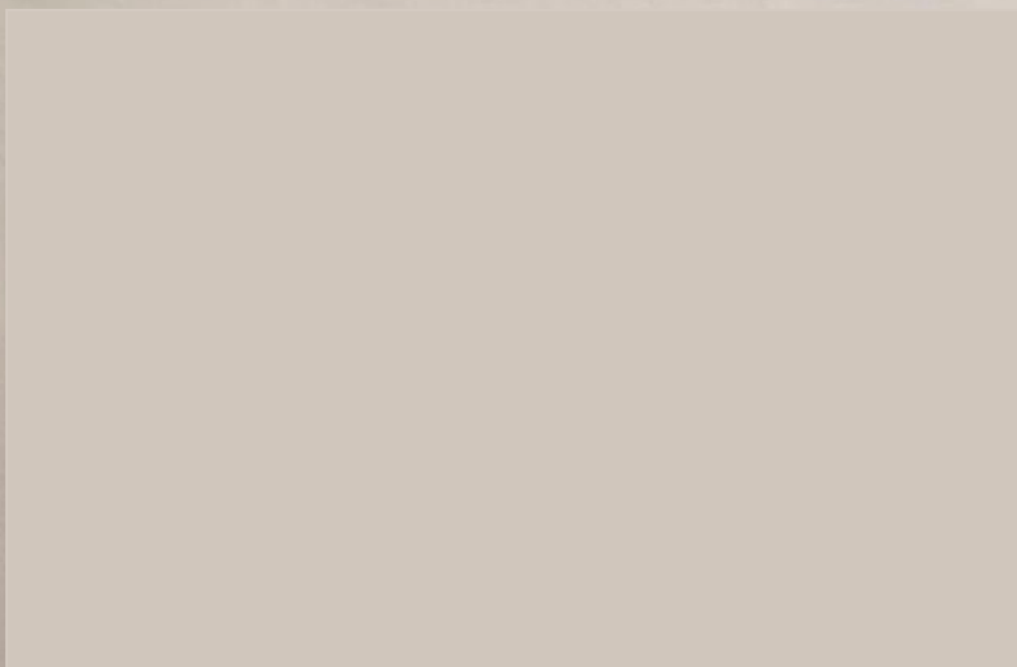
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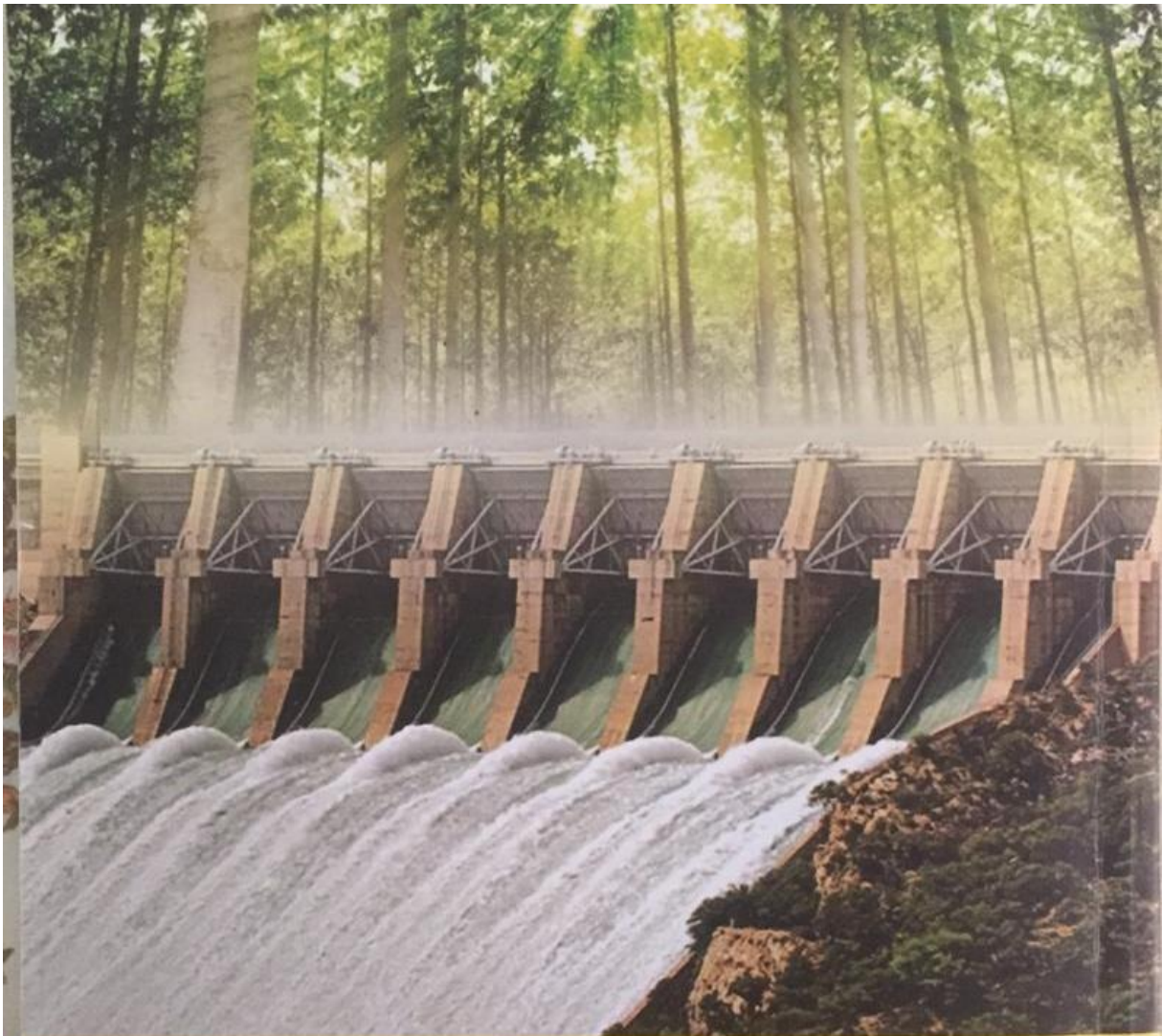


elevated CO<sub>2</sub> (600 μmol mol<sup>-1</sup>) concentrations. Drought stress was applied after germination at 7 days after sowing (DAS) by withholding the water application to 40% of water holding capacity. At 22 DAS photosynthetic parameters such as chlorophyll content (SPAD reading), photosynthesis rate, stomatal conductance and transpiration rate were determined. Plants were harvested and forced dried in oven for determination of shoot biomass. Elevated CO<sub>2</sub> increased shoot biomass under adequate magnesium and water supply however impaired Mg supply nullified or minimized this effect. Impaired Mg supply reduced shoot biomass by 7% and 6% under ambient CO<sub>2</sub> conditions however this effect was increased to 29% and 34% in well-watered and drought stressed plants respectively under elevated CO<sub>2</sub> conditions. Similar response was shown photosynthesis rate and chlorophyll content. Considering the results presented in this study it is concluded that future climate with increased CO<sub>2</sub> and severe drought would precipitate adverse effect of impaired Mg supply and adequate Mg fertilization would be very crucial in mitigating the adverse effects of climate change.

**Keywords:** climate change, magnesium, photosynthesis, wheat







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