



**Centre for
Ecology & Hydrology**

NATURAL ENVIRONMENT RESEARCH COUNCIL



30th Task Force Meeting

14th – 17th February 2017

Poznan, Poland



Poznań University of Life Sciences

Programme & Abstracts



ICP VEGETATION
30th Task Force Meeting

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Local financial support is provided by



OZONE DOSE-RESPONSE RELATIONSHIPS FOR DURUM WHEAT IN MEDITERRANEAN CONDITIONS

Marzuoli R.¹, Gerosa G.¹, Monga R.², Finco A.¹, Picchi V.², Faoro F.²

¹ *Dep. of Mathematics and Physics, Catholic University of Brescia, via Musei 41, Brescia, Italy*

² *DISAA, University of Milan, Via Celoria 2, Milano, Italy*

The aim of this study was to define an ozone (O₃) dose-response function and identify a critical level for the protection of *Triticum durum* in Mediterranean conditions. ‘Colombo’ and ‘Sculptur’ are two modern durum wheat cultivars that in previous studies proved to be very sensitive to O₃ stress at both eco-physiological and agronomical level. Two consecutive experiments on these cultivars were carried out in 2013 and 2014 at the Open-Top Chambers facility of Curno (Northern Italy). Plants of durum wheat were exposed to 2 and 4 different levels of O₃ in 2013 and 2014, respectively.

The seasonal accumulation of Phytotoxic Ozone Dose (as POD₆) and O₃ exposure (as AOT40) were correlated with the reduction of grain yield, total aboveground biomass, stems, number of spikes and hectolitre weight.

‘Colombo’ resulted more affected by O₃ than ‘Sculptur’ in both years of the experiments, with a significant decrease in yield and growth parameters. ‘Sculptur’ showed significant negative effects only in the highest O₃ level treatments.

Regression analysis on grain yield were performed using both the AOT40 and the POD₆, and the relative effects were calculated on the basis of the mean values of plants grown in Charcoal-Filtered OTC (-50% of ambient ozone). According to this study the POD₆ value causing a 5% of decrease in relative grain yield was around 3 mmol O₃ m⁻² for cv ‘Colombo’ and 4 mmol O₃ m⁻² for cv ‘Sculptur’.

Considering the two cultivars together, we can propose a critical level of POD₆ of 3.5 mmol O₃ m⁻² for a 5% reduction of grain yield to be used in the Mediterranean countries for *Triticum durum*. Analogously the AOT40 critical level could be set to 8’000 ppb.h. The critical level based on POD₆ is 3.5 times higher than that proposed in the Mapping Manual for *Triticum aestivum* (1 mmol O₃ m⁻²).

Results of this study demonstrate clearly that both relationships based on the O₃ exposure and POD₆ proposed in the Mapping Manual could overestimate the O₃ effects on durum wheat under Mediterranean conditions.

