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Fakultät für Naturwissenschaften
und Technik

Facoltà di Scienze
e Tecnologie

Faculty of Science
and Technology



IX Congresso Nazionale SISEF

Multifunzionalità degli Ecosistemi Forestali Montani: Sfide e Opportunità per la Ricerca e lo Sviluppo

16-19 Settembre 2013 | Libera Università di Bolzano

Comunicazioni Orali - Riassunti



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SCARCE EVIDENCE OF OZONE EFFECTS ON TREE DEFOLIATION AND GROWTH IN TRENITINO

Tropospheric ozone has been reported to affect forest health and growth, ultimately reducing the potential for C sink. It is therefore important to have reliable information on effects of ozone, especially for mountain forests, which are considered particularly sensitive to climate change and at the same time exposed to high ozone levels. Crown condition (2007-2009) and tree growth (2005-2009) data collected at the ICP Forests Level I (n=15) and Level II (Passo Lavazè) plots in Trentino were investigated in relation to site and environmental factors, including ozone. Ozone concentrations at the sites varied from 70 to 135 $\mu\text{g m}^{-3}$, leading to AOT40 values from 17,000 to 100,000 $\mu\text{g m}^{-3} \text{ h}$, *i.e.*, more than 10 times the UN/ECE Critical Level for adverse effect on trees. Stomatal ozone flux estimated at the Lavazè site was 20-35 mmol m^{-2} . Multiple regression (to study periodical defoliation and growth reported as relative Basal Area Increment, BAI) and Linear Mixed Models (LMM, to study annual defoliation data) were used. Both multiple regression and LMM showed that defoliation values increased with increasing frequency of reported tree damage (biotic abiotic) and with decreasing level of foliar N:K. Relative BAI was reported to increase with foliar N:Mg and to decrease with diameter, considered as a proxy for age. Despite the high values recorded, and within the examined dataset, ozone was never reported as a significant predictor of defoliation and BAI at the sites in Trentino. These results were further confirmed for the 2000-2009 period, taking into account AOT40, stomatal flux, defoliation and growth at the Passo Lavazè site. Large variations in exposure and flux did not result into consistent variation in growth and defoliation. Two aspects deserve closer examination: (i) the reported relationships with observed damage and nutritional status; and (ii) the possible adaptation mechanisms to oxidative stress that may have occurred over time.

Parole Chiave: AOT40, Effects, Ozone, Linear Mixed Models, Multiple Regression Models, Stomatal Flux

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