

## Climate Change and Food Security: Effects of Ozone on Crops in North-West Pakistan

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**Abstract :** Although ozone is well-documented to affect crop yields in the densely populated Indo-Gangetic Plain, there is little knowledge of its effects around cities in more remote areas of South Asia. We surveyed crops around the city of Peshawar, Pakistan for visible injury, linking this to passive measurements of ozone concentrations. Foliar injury was found in the field on potato, onion and cotton when the mean monthly ozone concentration reached 35-55ppb. The symptoms on onion were reproduced in ozone fumigation experiments, which also showed that daytime ozone concentrations of 60ppb and above significantly reduce the growth of Pakistani varieties of both spinach (*Beta vulgaris*) and onion. Aphid infestation on spinach was also reduced at these elevated ozone concentrations. The ozone concentrations in Peshawar are comparable to those through many parts of northern south Asia, where ozone may therefore be a significant threat to sensitive vegetable crops in peri-urban regions.

**Keywords :** ozone, air pollution, vegetable crops, peshawar, south asia

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