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"Gheorghe Asachi" Technical University of Iasi, Romania

OZONE POLLUTION AND THE EFFECTS ON CROP YIELDS AT A COASTAL SITE IN THE YANGTZE DELTA

Wenpo Shan[1*], Haixia Lu[2], Pengyan Liu[1], Zhanchen Li[1], Da Lu[1], Wei Liu[1], Zhe Qin[1]

[1]College of Chemistry and Environmental Science, Hebei University, Baoding 071002 PR China
[2]College of Information Science & Technology, Hebei Agricultural University, Baoding 071001, PR China

Abstract

Based on the measurement at a coastal site in the Yangtze Delta, the temporal variation characteristics of ozone and the influences of the precursors (NO, NO_2, and CO) and meteorological conditions were analyzed. Also the crop yield loss by ozone exposure at the site was estimated and discussed. The variation of daytime ozone showed a two-peak pattern during the year with one peak in spring and the other in summer, while the nighttime ozone just presented one peak in spring. The diurnal variation of ozone in each season shows a typical pattern for polluted area. Temperature presented a well-defined monthly variation in the year, with minimum in January and maximum in July. However, the variation of wind speed did not show a clear trend. The variation of daytime ozone level was significantly influenced by the sunshine duration. Ozone levels during maritime winds were obviously higher than those during continental winds in each season. A rough estimation confirmed that more yield reduction of winter wheat occurred in the coastal region than in the inland region due to the influence of maritime winds. However, more accurate dose-response relationships between ozone exposure and yield loss of crops are needed in the Yangtze Delta, and the yield reductions of summer time crops caused by the high summer and autumn ozone exposure in the coastal areas need to be studied further.

Key words: coastal site, ozone pollution, temporal variation, Yangtze Delta, yield reductions

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∗ Author to whom all correspondence should be addressed: e-mail: wenposhan@hotmail.com; Phone: +86 312 5079422; Fax: +86 312 5079422