

Welcome to My Presentation

Presented By

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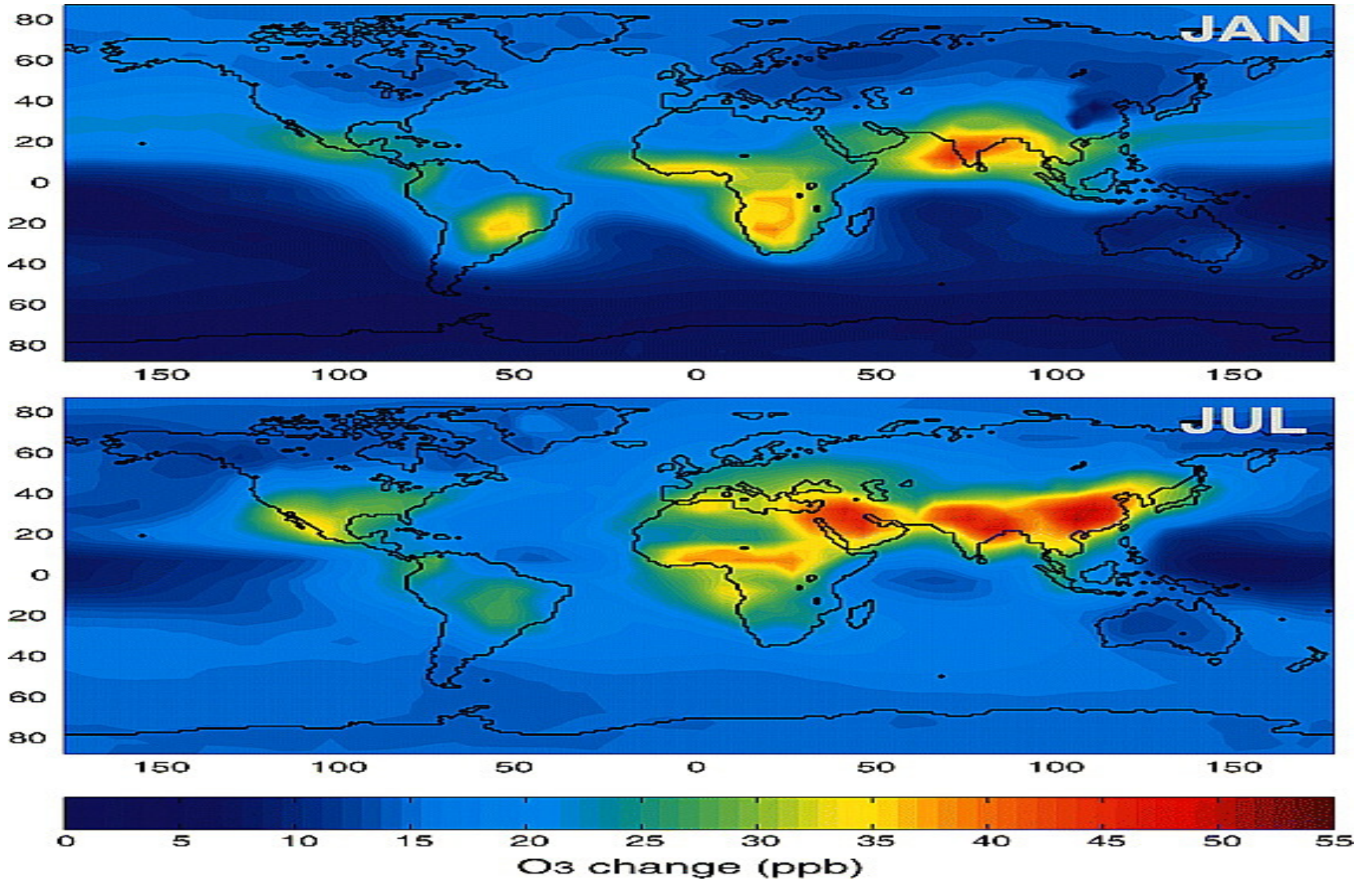


ASSESSING THE IMPACTS OF TROPOSPHERIC OZONE ON CROP LOSSES IN BANGLADESH

Ambient Ozone (Tropospheric ozone / Ground level ozone)

Key Points:

- Secondary air pollutant.
- Most widespread and phyto-toxic pollutant (Emberson *et al.* 2006).
- It has been identified as a main threat for crop production (Bueker *et al.* 2006).



Difference in Ozone Concentration (ppb) Between current day and 2100



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Effects on Crops

- ❖ Induce visible injury, which reduce the economic value of leafy crops, such as spinach and lettuce (e.g. Emberson *et al.*, 2003).
- ❖ Reduce photosynthetic rate (e.g. Lehnherr *et al.*, 1997; McKee *et al.*, 1997).
- ❖ Accelerate leaf senescence (e.g. Grandjean and Fuhrer, 1989).
- ❖ Affect crop quality (e.g. nitrogen content of grains and nutritive quality of forage crops).
- ❖ Protein production in wheat per unit ground area decreased, with increasing O₃ concentrations (Pleijel *et al.*, 1999).



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Effects on crops (Contd.)

- **Increasing O₃ had a negative impact on tuber quality in potato (Vorne *et al.*, 2002).**
- **Increased ozone concentrations creat biomass reduction of sensitive crop species, such as wheat, rice, beans and potatoes (e.g. Tingey *et al.*, 1993; Fuhrer *et al.*, 1997; Agrawal *et al.*, 2003, 2006).**
- **To cause declines in the yield of many crop species, such as wheat, rice, soybean and cotton (e.g. Fuhrer *et al.*, 1997; Fuhrer and Booker,2003).**
- **Decrease nutritive quality for ruminant animals associated with O₃**
- **induced accelerated senescence (Sanz *et al.*, 2005).**

The highest economic losses were investigated in Europe by (Mills et al., 2003).

with wheat (32.6% of total),

potato (21.4%),

sugar beet (9.5%),

pulses (6.4%), grape (5.9%),

maize (5.9%) and

sunflower (4.4%).

**Works performed on Impacts of Tropospheric ozone on
different crops in different countries**

Countries	Crops
UK	Clover, wheat, rice, soybean, Cotton, potato.
Europe	Clover, potato, spinach, lettuce.
USA	Tobacco, clover
Germany, Netherlands	Comon bean
India	Mung bean
Pakistan	Wheat
Italy	Clover
Bangladesh	X

Objectives of the Experiment

- To identify areas in Bangladesh where the ozone concentrations are sufficient to induce ozone-specific injury on ozone-sensitive plants
- To assess the biological impacts of increased ozone concentrations on crop plants in Bangladesh and
- To determine the frequency of ozone injury and to examine temporal trends of ozone injury development