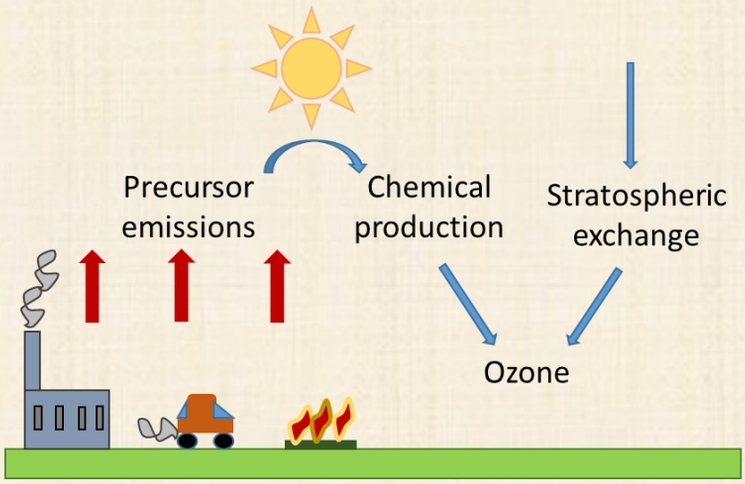
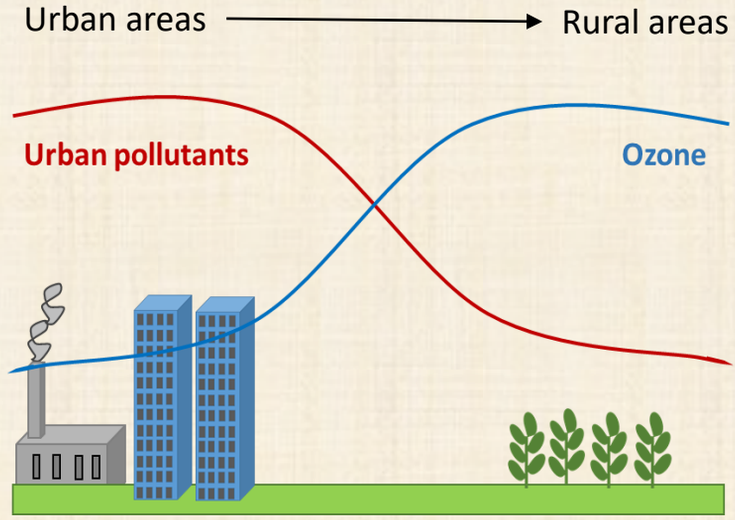
Ground-level ozone: Damaging crop production

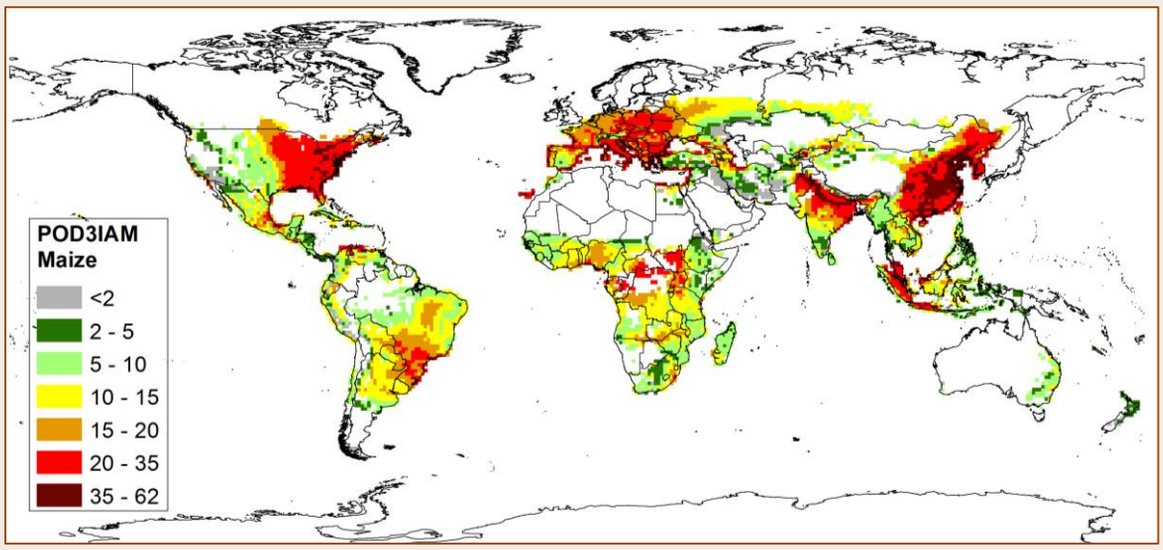
In the upper layers of the atmosphere ozone is beneficial because it protects us from harmful UV light from the sun. At ground level ozone is a harmful pollutant. There are natural sources of ozone, but it is also formed in sunlight from air pollutants emitted from human-made sources such as vehicles, industry and biomass burning. Ozone concentrations tend to be high in agricultural areas downwind of large cities as ozone is broken down more quickly in urban areas.





Ozone levels are increasing rapidly in developing regions due to increasing emissions of precursor pollutants. There is evidence of a large increase in ozone concentrations in South East Asia, and models project increases in Africa too.

Modelled ozone uptake by crops in crop growing areas are used to predict where ozone impacts occur. There are large impacts on crop yield across many regions worldwide, for crops including wheat, maize, soybean and rice.



Modelled ozone uptake in areas where maize is grown.

Examples of impacts of ozone on crops and pastures

Ozone impacts have been shown using experiments, both by adding ozone to air and by filtering ambient air to show improvements in plant health. It is important to monitor impacts in the field to verify where effects are occurring.

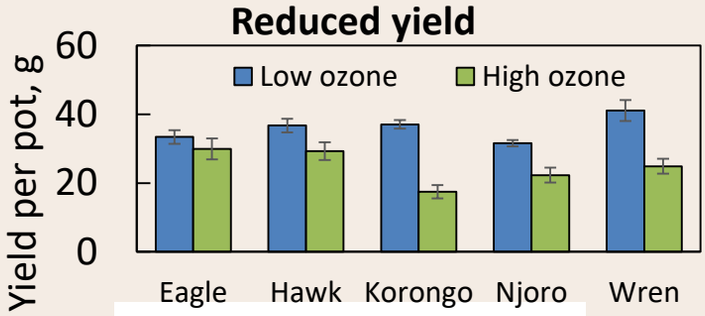
Increased senescence / early die-back

Amaranth

Increased visible leaf injury

Finger millet

Reduced yield

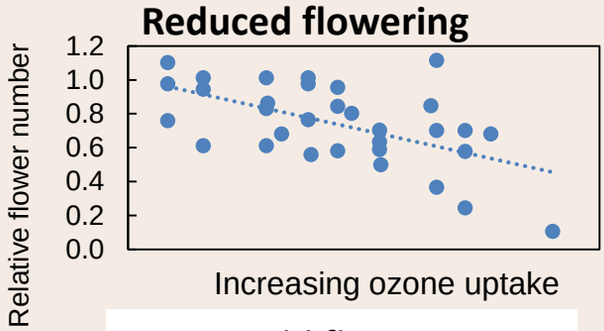


Kenyan wheat

Reduced seed size and number

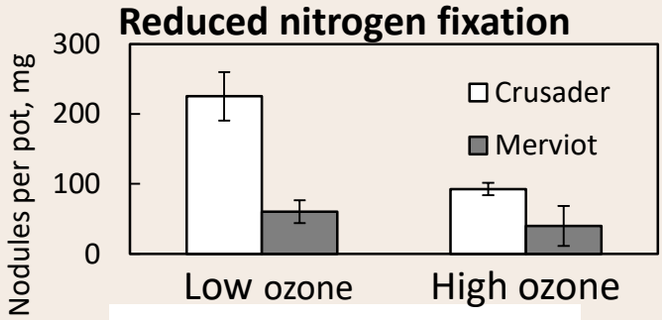
Bean

Reduced flowering



Wild flowers

Reduced nitrogen fixation



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