

Decreasing Nitrous Oxide Emissions from High Rainfall Cropping Systems



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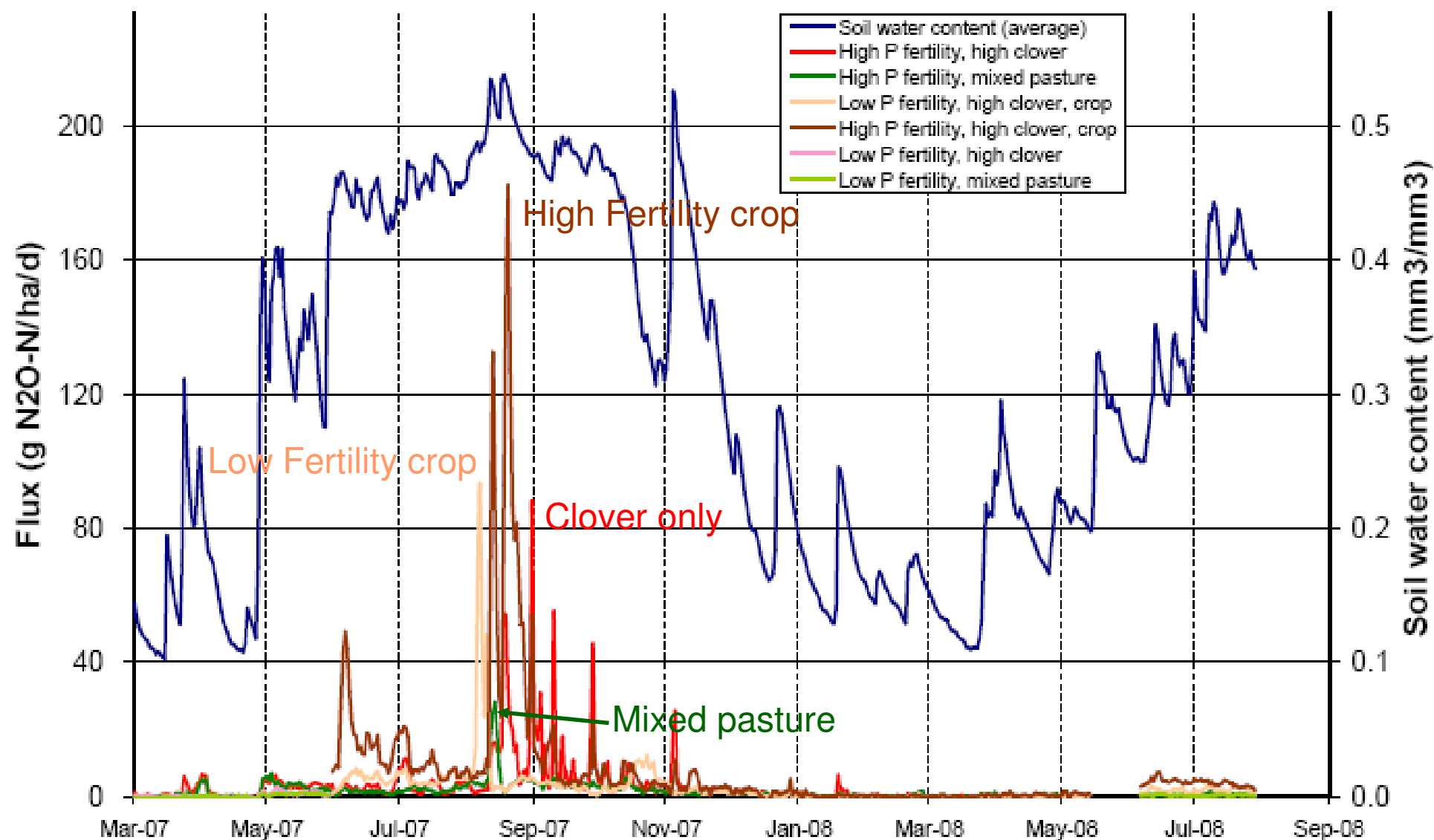
Recent studies at Hamilton Vic. (2007 – 2008)

Using automated chambers connected to a Fourier Transform Infrared Spectrometer (FTIR), N₂O emissions were continuously measured over 2 years on long term high and low fertility mixed pastures that had been converted to legume only, and then sown to wheat, in a pasture legume crop rotation system.

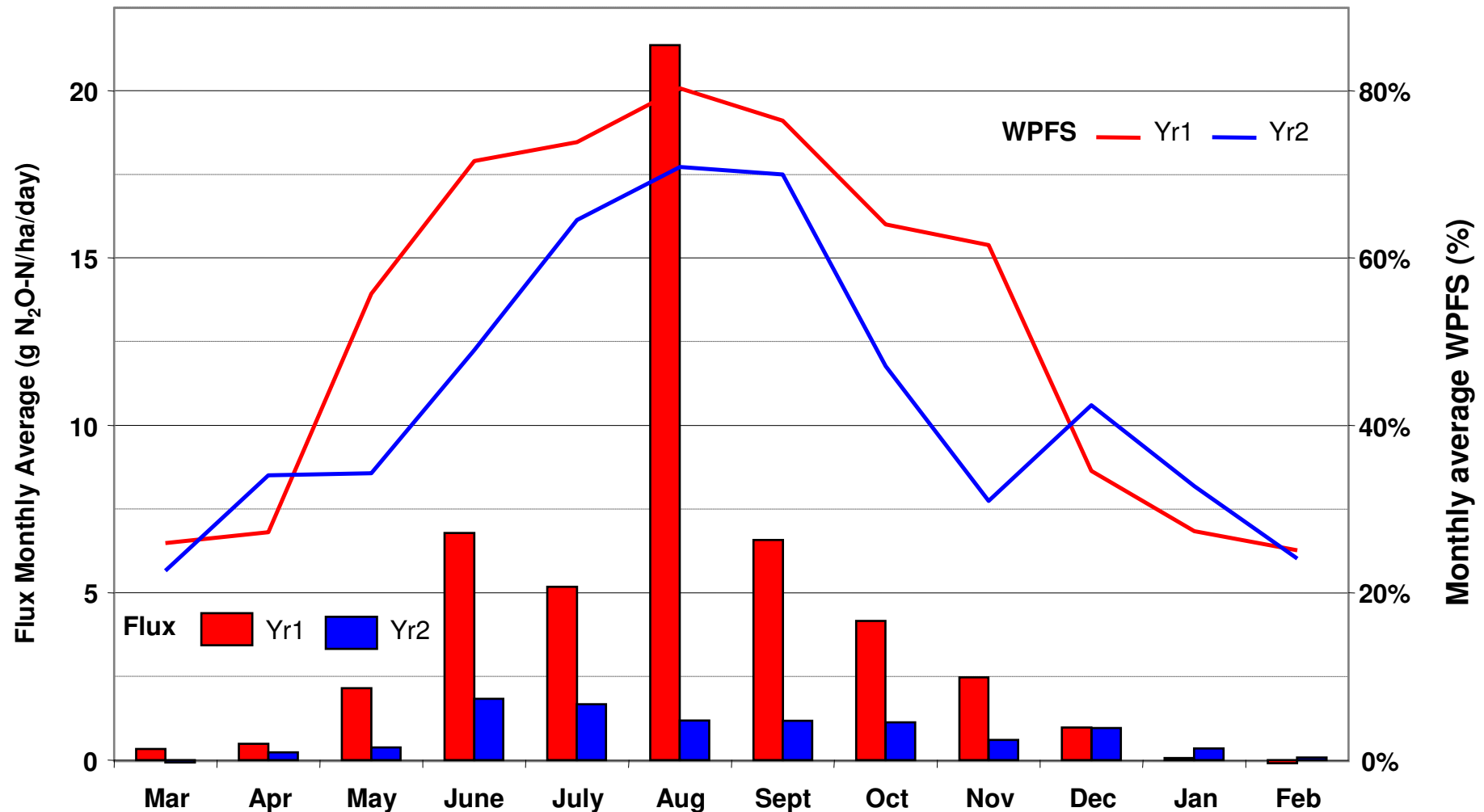
Results

- High emissions can occur when soil nears saturation
 - Emissions are higher on disturbed crop soil compared to pasture
- Emissions are higher on pure clover swards compared to mixed pasture
- Emissions are higher on more fertile soils

Soil moisture and N₂O flux for the different treatments

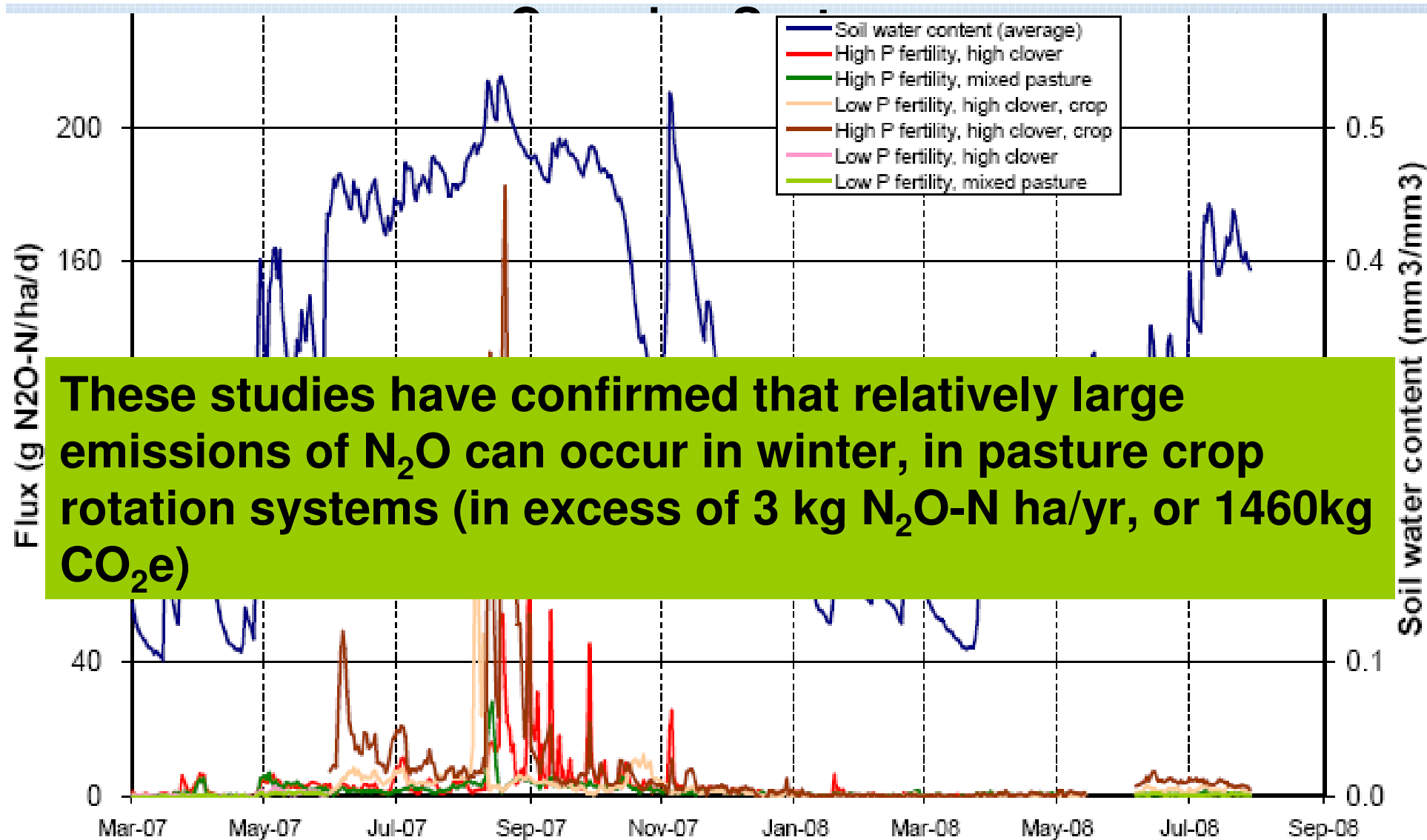


Soil moisture and monthly N₂O flux for the high fertility wheat 2007 & 2008



Lower soil moisture in 2008 and therefore much lower emissions

Soil moisture and N₂O flux for the different treatments



These studies have confirmed that relatively large emissions of N₂O can occur in winter, in pasture crop rotation systems (in excess of 3 kg N₂O-N ha/yr, or 1460kg CO₂e)

NEW Project

Hypothesis:

- Higher emissions from conventional tillage compared to direct drill.
- Inhibitor will decrease N₂O emissions from cropping systems

Cropping system

- Long term mixed perennial pasture is converted to legume
- Sown to wheat using either direct drilling
- Sown to wheat using conventional tillage
- The above with and without inhibitor, e.g. (DCD) will be examined

Measurements

Using automated chambers connected to a Tunable Diode Laser (TDL) N₂O will be constantly monitored to compare emissions from the different treatments, as well as continuous measurement of soil moisture, temperature, soil chemical properties and weather.



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