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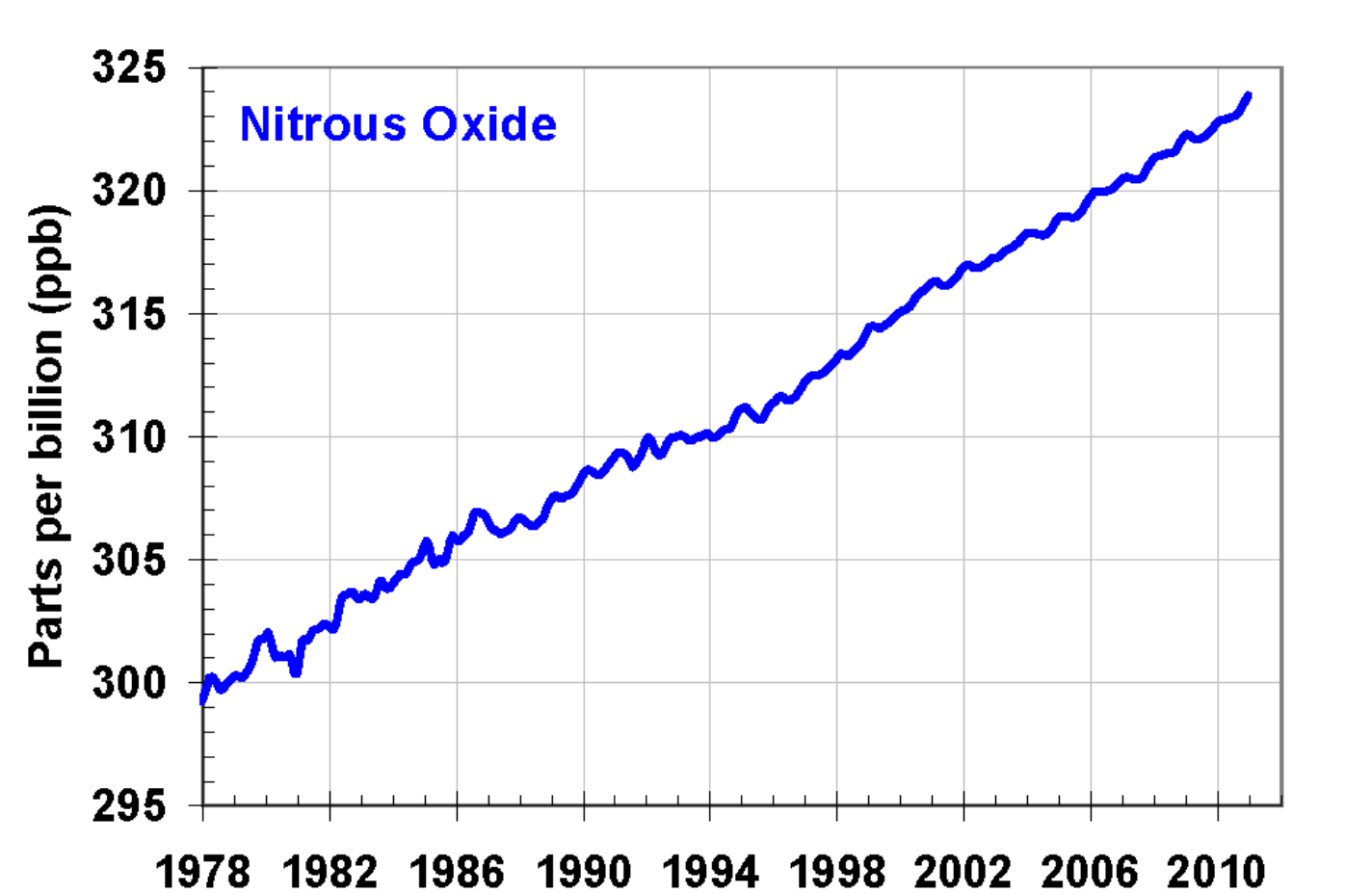
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Nitrous oxide fluxes by croplands

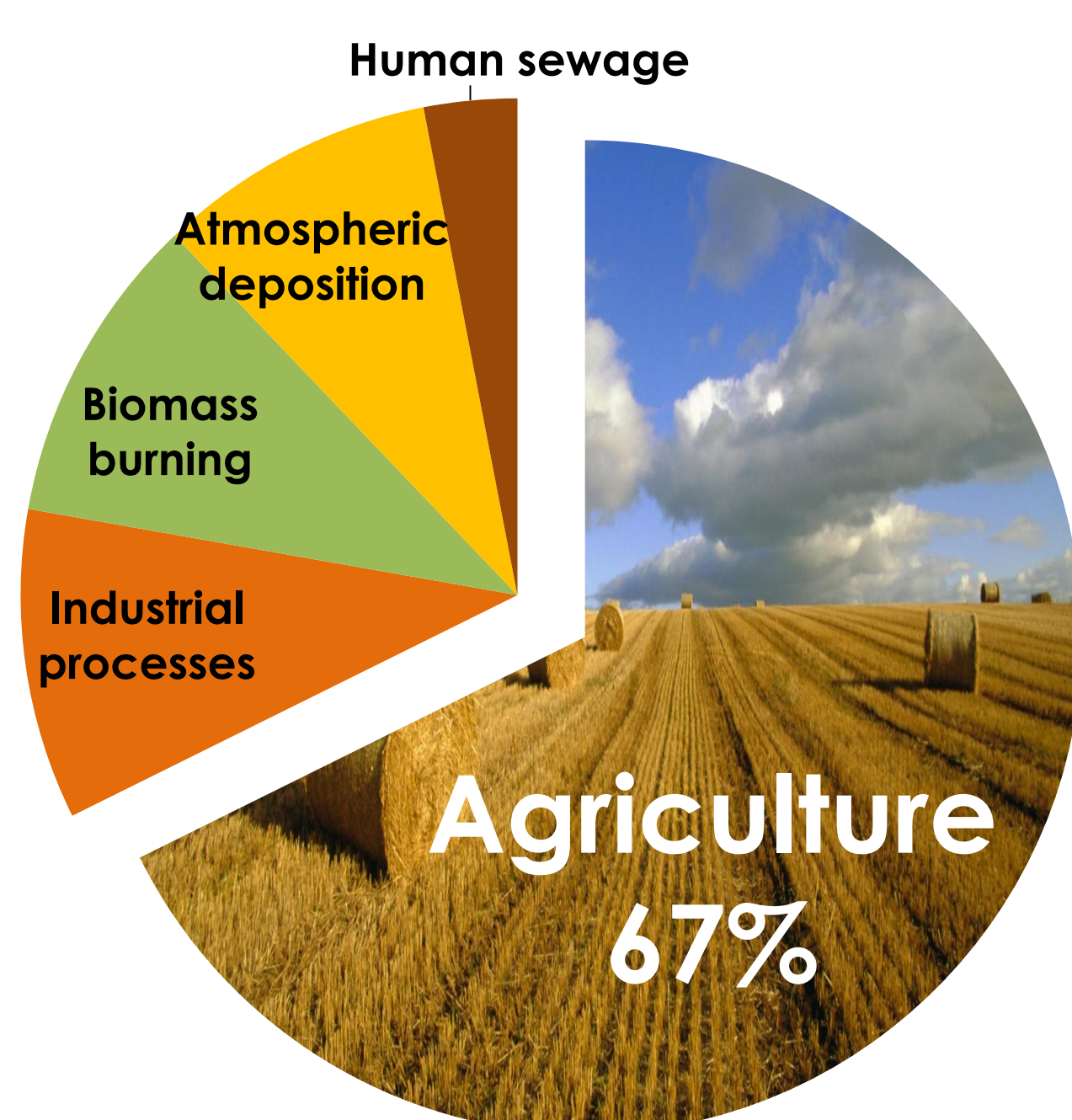
Towards a better understanding of emission mechanisms and dynamics

ENVIRONMENTAL PROBLEMATIC

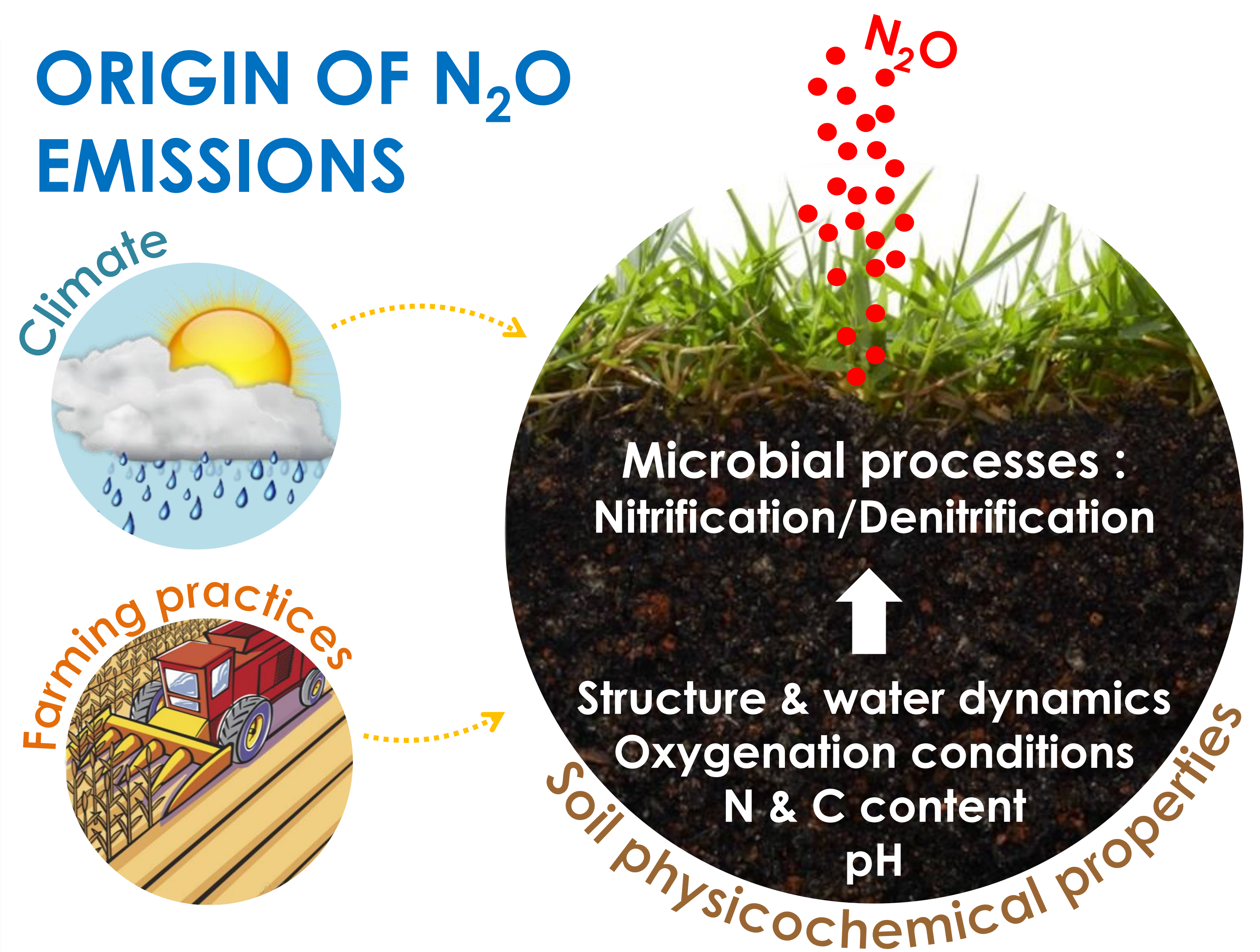
- N₂O is a **major greenhouse gas** and a contributor to **ozone depletion**
- Its Global Warming Potential is **300 times greater** than the GWP of CO₂
- Atmospheric concentration has **increased by 20%** since 1750 (industrial era)
- **Agriculture** is the **main anthropogenic source** (2.8 Tg N₂O-N.year⁻¹)



IPCC, 2013.



ORIGIN OF N₂O EMISSIONS



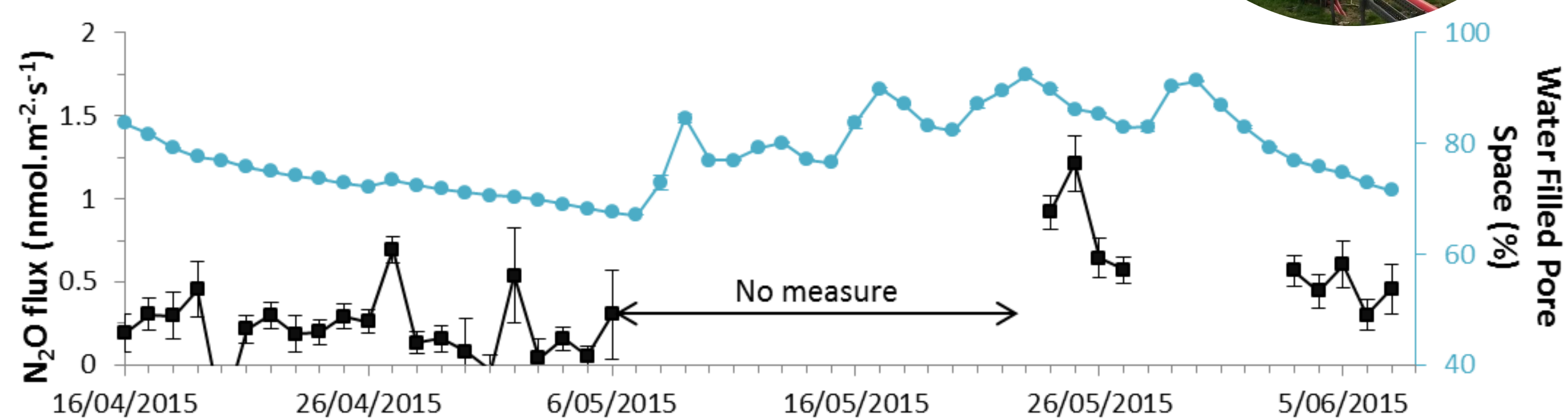
- **Characterization** and **quantification** of the relations between these variables and N₂O emissions have not yet been fully achieved !
- **Need for more continuous measurements to understand mechanisms and dynamics**

METHODS FOR IN SITU FLUX MEASUREMENTS

Eddy covariance

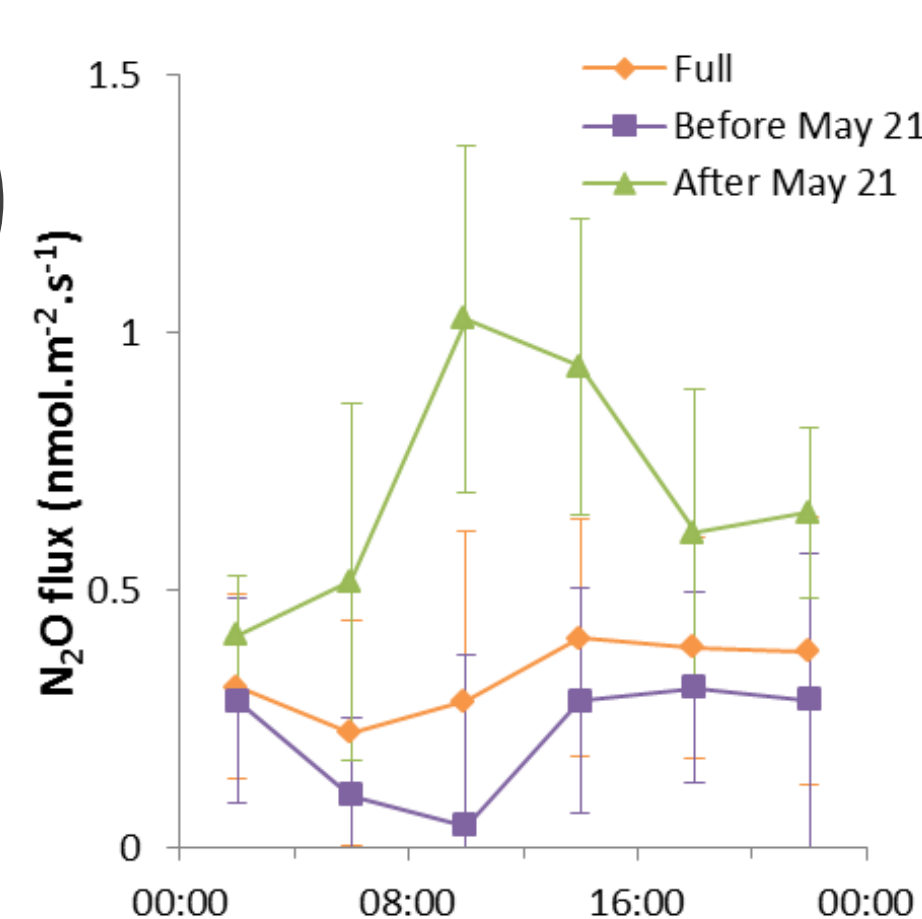
- **Principle** : covariance between wind velocity and N₂O atmospheric concentration
- **Use** : continuous ecosystem follow-up with high temporal resolution

Lonzée Terrestrial Observatory
(Gembloux, Belgium)
Crop follow-up (30min resolution)
16-Apr to 8-May 2013, Winter wheat



- Important temporal variability
- WFPS can trigger emissions (24/05)

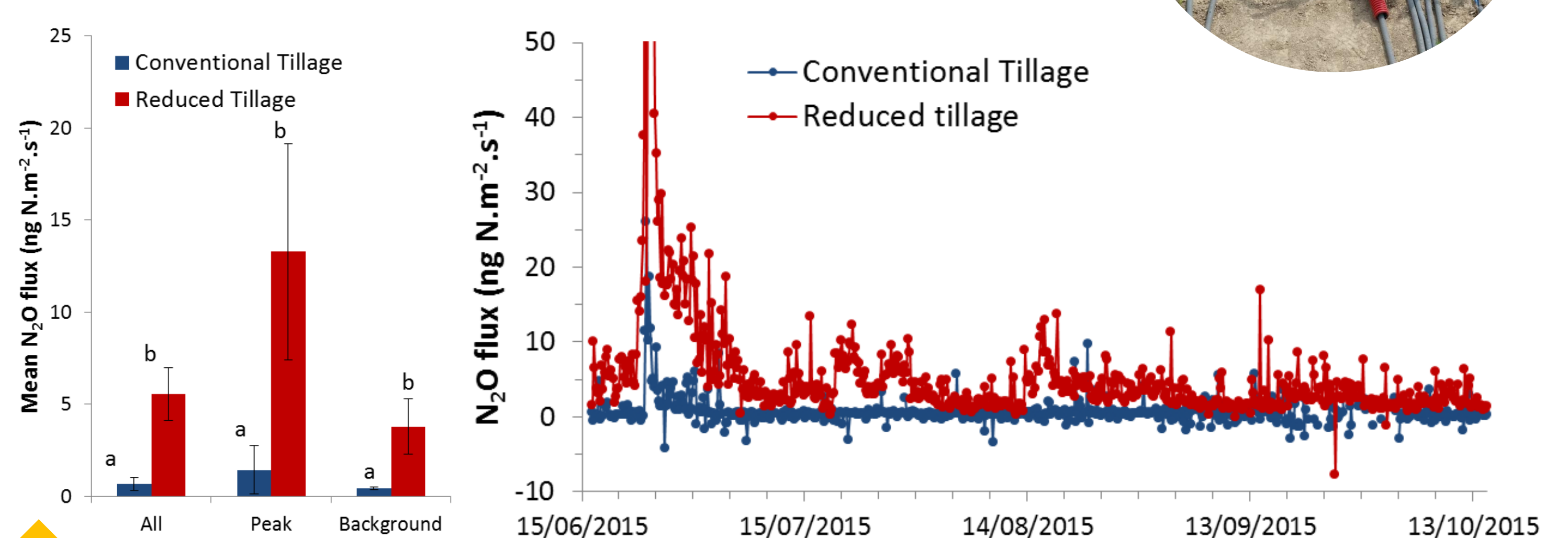
- Daily cycle
- Hypotheses : link to temperature or to plant activity



Closed chambers

- **Principle** : N₂O accumulation in temporally enclosed volume above soil surface
- **Use** : experiments on agricultural practices at small spatial scale

AgricultureLife experimental parcels
(Gembloux, Belgium)
Comparison of 2 tillage treatments
16-Jun to 15-Oct 2015, Maize



- Significantly higher N₂O emissions for reduced tillage

- Significantly higher N and C soil content (full squares) for RT
- Tillage impacts organic matter and microorganisms activity

