Vielsalm, Lonzée, Dorinne
Three Belgian sites
La Robinette (RTO)

Lonzee (LTO)

Dorinne (DTO)

Vielsalm (VTO)
Vielsalm

Start Euroflux Standards

Upgrade to ICOS standards

1996 2000 2004 2008 2009 2013 → 2021...

In average:

sink 400-600 gC m^-2 yr^-1

Bernard Heinesch

Marc Aubinet – Ancillary data protocol workshop ICOS – Gembloux 2015
Prior to 1996:
- Start Euroflux Standards

1996:
- Biomass inventories
- Soil respiration

2000:
- Tower Height change

2004:
- Upgraded to ICOS standards

2008 and 2009:
- Advection
- Soil CO$_2$ profiles
- VOC fluxes (eddy covariance)

2013 onwards:
- Sap flow
- Evapotranspiration
- Interannual variability

Eddy covariance Methodology

Marc Aubinet – Ancillary data protocol workshop ICOS – Gembloux 2015
Vielsalm

Harmonization of 19 years of eddy flux measurements: Actualization of methodology

Anne De Ligne

NEE [kg m\(^{-2}\) day\(^{-1}\)]

Vielsalm

NEE correlates well with green proportion of phenological images. At seasonal scale and at annual scale.

[Graphs showing correlation between NEE and green proportion over different years.]
Vielsalm

Caroline Vincke

Rémy Soubie

Comparison of Evapotranspiration estimates by independent methods
(eddy covariance, sap flow, model, soil water budget)

Annual estimates

2010

2011

Eddy covariance

Sap flow

Daily estimates [mm]
(2010 – 2011)
2004

Start Euroflux Standards

2013 → 2021...

Upgrade to ICOS standards

Average on a four year rotation: slight carbon source (55 g m\(^{-2}\) yr\(^{-1}\))

In progress : 12 years budget

Marc Aubinet – Ancillary data protocol workshop ICOS – Gembloux 2015
Lonzée

2004
Start Euroflux Standards
Continuous Biomass Follow-up
Soil respiration: autotrophic and heterotrophic components
Impact of management

2013 → 2021...
Complete Carbon balance
Four year crop rotation
VOC fluxes (eddy covariance)
N₂O Fluxes (eddy covariance)

Upgrade to ICOS standards
N₂O Fluxes (chambers)
Discrimination between heterotrophic and autotrophic components of respiration
Long term measurements of BVOC fluxes show that classical models and IPCC emission factors overestimate methanol fluxes over maïze by a factor > 10.
In progress: Installation of an eddy covariance system for N2O fluxes
Average on four years: sink of ~ 200 g m\(^{-2}\) yr\(^{-1}\)

In progress: budget consolidation of (uncertainty analysis)

Marc Aubinet – Ancillary data protocol workshop ICOS – Gembloux 2015
Continuous Biomass Follow-up

Soil respiration

Impact of grazing

Rotational vs continuous grazing

Methane fluxes (eddy covariance)

VOC fluxes (eddy covariance)

N₂O Fluxes (chambers)

Eddy covariance

Methodology:

Uncertainties on carbon balance

Animal geolocalisation

Dorinne
First estimate of methane emission based on eddy covariance: 52 – 84 kg LU\(^{-1}\) yr\(^{-1}\)

In progress: refinement using cattle geolocalisation system
Direct (←) and indirect (↑) impacts of grazing on NEE
Dorinne

Louis Gourlez de la Motte

Grazing management directly impacts NEE

Ossénatou Mamadou

NEE difference between continuous and rotational grazing (2015)

NEE difference between continuous and rotational grazing

Difference [μmol m⁻² s⁻¹]

Time [days]
Thank you!