Grass biomass assessment at field scale in Wallonia based on Sentinel data

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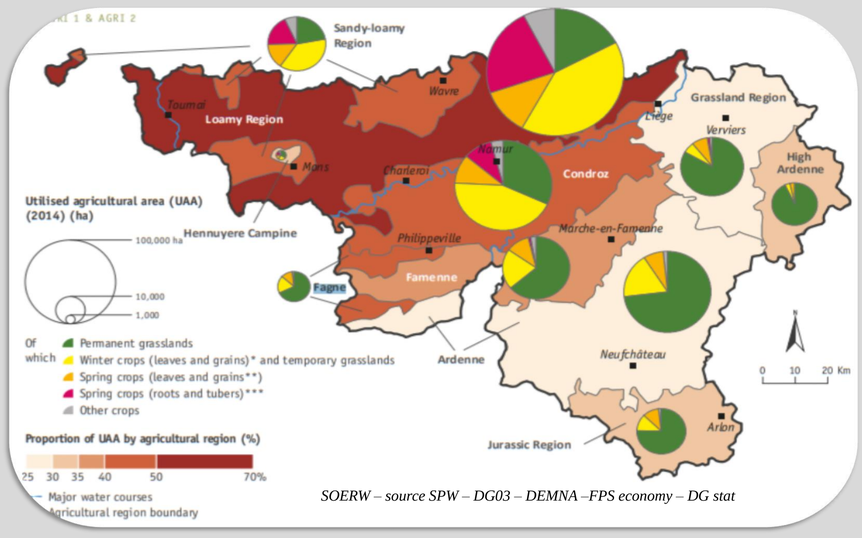
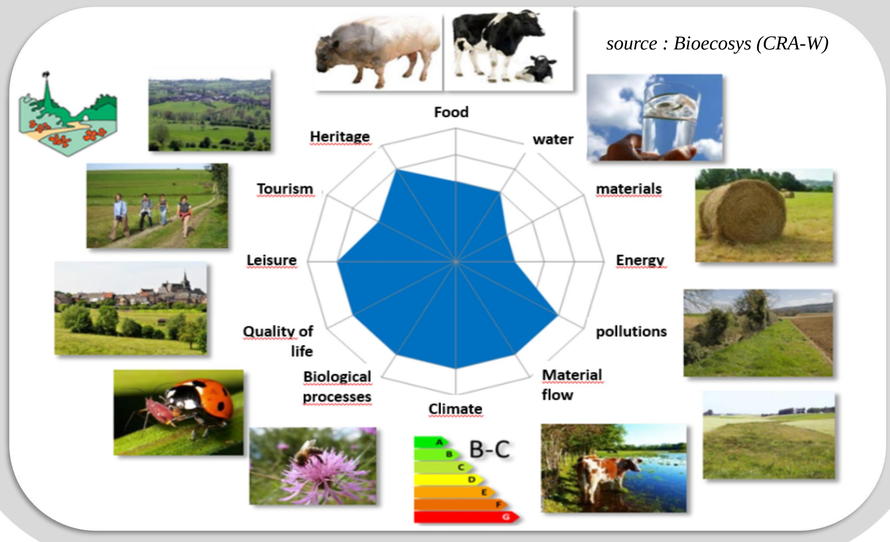
Grassland, an important ecosystem in Wallonia…



SOERW – source SPW – DG03 – DEMNA –FPS economy – DG stat

…providing different ecosystem services



Managing pastures is a difficult exercice relying on permanent adjustements between grassland production (quantity / quality) and cattle needs

Tools measuring compressed sward height (CSH) are available for quantifying grassland production

Pros :

- Objectivity
- Inputs for several management tools
- A regional calibration exists for Wallonia (source: Effort project)

$$Available\ Biomass\ \left(\frac{Kg\ DM}{ha}\right) = 215\ \left(\frac{Kg\ DM}{cm * ha}\right) * CSH\ (cm)$$

cons :

- Time consuming (1h for 10ha)

Optimal situation :

- Managing and not measuring
- Being able to monitor the current grass growth and its (short-term) evolution
- A better assessment of intra-field heterogeneity
- Monitoring grass production and quality
- Developping an user-oriented Decision Support System

SUNSHINE project (04/2022 – 31/03/2025) aims at the development of a **Decision Support System** allowing :

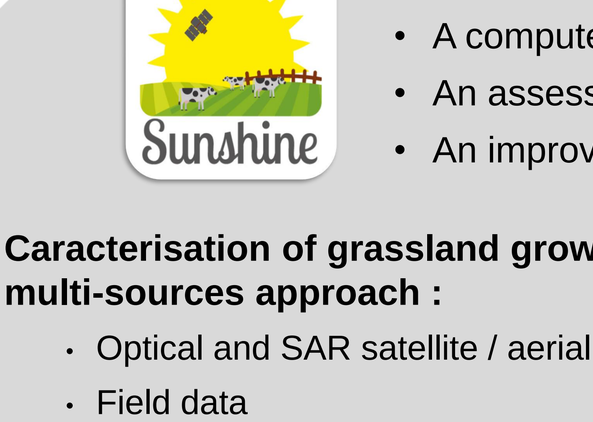
- A computerized management of mowing calendars
- An assessment, in articulation with the mowing calendars, of grassland growth (quantity/quality) and its evolution
- An improvement, on this basis, of rationing tools

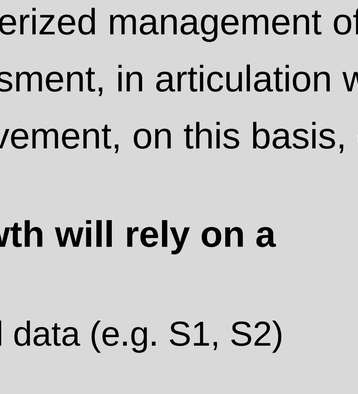
Caracterisation of grassland growth will rely on a multi-sources approach :

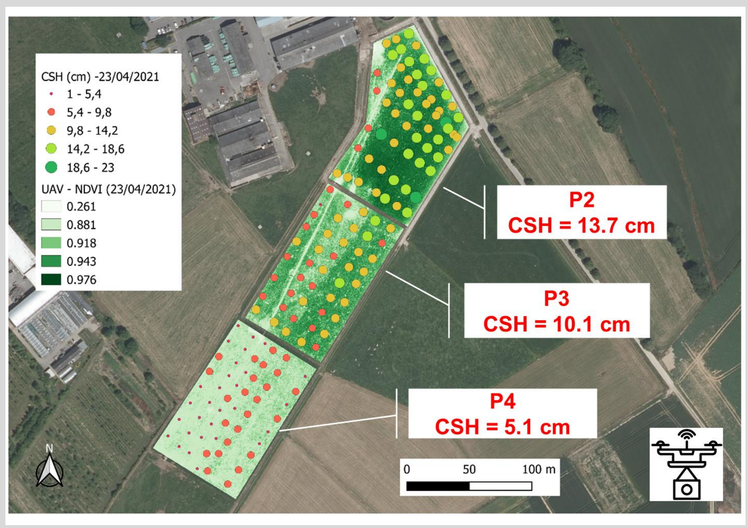
- Optical and SAR satellite / aerial data (e.g. S1, S2)
- Field data
- Observed and forecasted weather data
- Grassland growth models

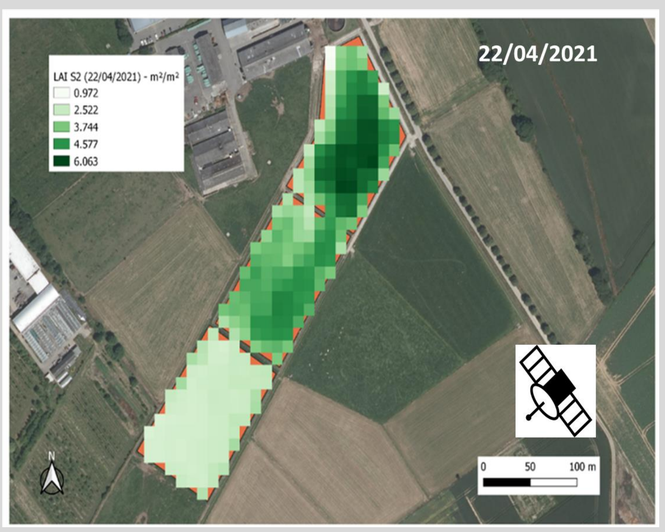
2022 field campaign:

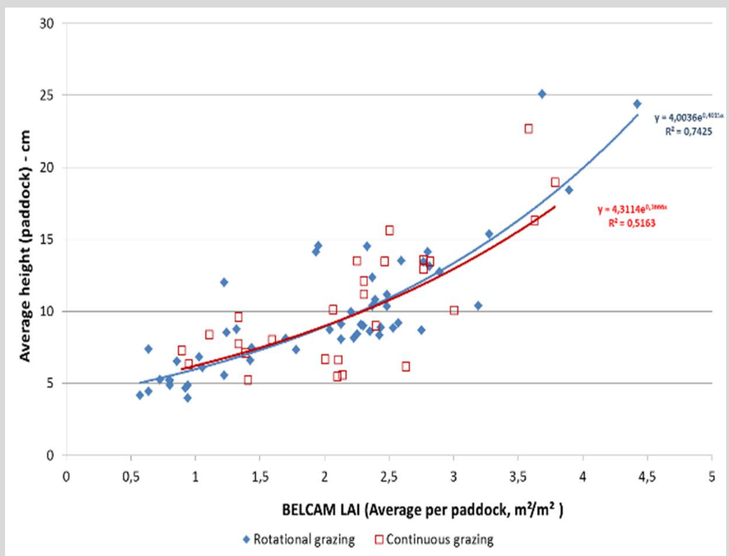
- 16 farms distributed in Wallonia;
- 3-5 grassland parcels per farm;
- Weekly measurements of CSH;
- Monthly assessment of biomass & quality;
- Recording of parcels management;











Top (left) : Distribution of compressed sward heights measured in 3 grassland parcels (rotational grazing) in Gembloux and of NDVI values estimated by a MicaSense RedEdge-M camera onboard of an UAV (DJI Matrice 210) – observation date : 23/04/2021

Top (right) : S2-based Leaf Area Index (LAI) for 3 grassland parcels (rotational grazing) in Gembloux - observation date : 23/04/2021

Bottom (right) : Relationship between CSH at paddock level (~50 CSH per paddock) and BELCAM (S2-based) Leaf Area Index for grasslands monitored weekly between mid-June and end of September 2019 in Libramont.

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