



eip-agri  
AGRICULTURE & INNOVATION

## Grazing for carbon

### How to increase the soil carbon content in grazing systems?

The potential of grasslands as a carbon (C) sink in Europe is large and grazing systems are important for C storage. However, it is unclear to what extent different grazing systems can contribute to C sequestration. The EIP-AGRI Focus Group 'Grazing for Carbon', a temporary group of 20 selected European experts from research and practice, shared knowledge and experience from different disciplines on the relationship between grazing and soil C. The overall aim was to identify how to increase the soil C content in grazing systems.

A quick literature review showed that there is net C sequestration within grassland systems in general, but in a mixed grazing and cutting system there is less C sequestration than under a pure grazing system.

The key challenge for sustainable grazing livestock systems is to find the optimal type of management to combine animal production with the delivery of other ecosystem services like C sequestration.

The EIP-AGRI Focus Group 'Grazing for Carbon' recommends that optimal grazing management should focus on both:

- ▶ additional C sequestration (where possible), and
- ▶ preserving current C stocks

There are still knowledge gaps about the best way to manage grazing systems for C across the different environments in Europe today and in the future with climate change, and about the mechanisms behind the practices and the solutions.

The EIP-AGRI Focus Group recommended that emphasis is put on the success and fail factors for increasing the soil C content in grazing systems:

- ▶ improve the understanding of strategies promoting better soil C management in grazed grasslands
- ▶ provide guidelines for good grazing management/education/knowledge dissemination
- ▶ develop incentives to promote the adoption of good and appropriate grazing systems
- ▶ establish monitoring schemes for C storage

***"Increasing the soil organic matter of my soils is a win-win situation: my grasslands are more resilient to drought and to wet conditions while the carbon sequestration contributes to climate mitigation and adaptation. Soil is your capital. You need to grow it, not spend it."***

- Rob Richmond (United Kingdom), farmer from the

EIP-AGRI Focus Group on increasing the soil carbon content in grazing systems -

# Grazing for carbon

## Ideas for Operational Groups

- ▶ Develop quick, low-cost and easy to apply monitoring techniques that help farmers and advisers in their management decisions to enhance C sequestration
- ▶ Look for the optimal choice of (local) seed-mixtures to support C sequestration, N fixation, resistance to extreme weather events, species persistence etc., in specific regions
- ▶ Maximise the potential for C sequestration of mixed forest-grassland systems (e.g. agroforestry and silvopastoral,...)
- ▶ Promote best quality and persistence of swards, showing positive and negative effects of different practices (sown diversity, N, irrigation, mulching, harrowing, grazing management)
- ▶ Increase plant and animal production, soil quality and biodiversity by converting traditional management to alternative/conservation management
- ▶ Design successful silvopastoral systems: optimise the design of landscapes (e.g. planting of landscape elements including trees/hedgerows) to increase productivity of grazing animals, trees/fruit, C sequestration and other ecosystem services (biodiversity, nature related touristic activities)

## Research needs

- ▶ Understand the links between C sequestration / organic matter and other ecosystem services and develop robust indicators to monitor different ecosystem services at the same time
- ▶ Meta-analysis: compile current knowledge on how different grazing systems affect soil C sequestration and determine the best grazing systems for C storage under different pedoclimatic conditions
- ▶ Identify region-specific species and mixtures for grazing, determine the impact of grazing on the productivity and persistence of mixtures and identify the best mixtures to maintain or increase the soil carbon
- ▶ Holistic approach: identify trade-offs and synergies between C sequestration and other ecosystem services and identify best grazing management to optimise ecosystem services for local conditions
- ▶ Assess the effectiveness of incentives on long-term C sequestration
- ▶ Create guidelines to optimise animal production while maintaining or increasing soil C
- ▶ Look at the effect of grazing intensity and nutrient fertilisation on C:N:P:S ratios in plants and on C sequestration
- ▶ Understand the intrinsic motivation of farmers / mind-set of farmers

## More ideas for Operational Groups and research needs available in the Focus Group report



### More information on the EIP-AGRI website

<a href="#">Focus Group webpage</a>	<b>Inspirational ideas:</b> <ul style="list-style-type: none"><li>- <a href="#">Portuguese farmers sow biodiverse pastures to reverse the degradation of Mediterranean ecosystems</a></li><li>- <a href="#">A passion for permanent pasture</a></li><li>- <a href="#">Cutting atmospheric carbon: a central role for soils- Agrinnovation magazine n°4 - p.19</a></li><li>- <a href="#">Climate-friendly practices</a></li><li>- <a href="#">Swedish organic farm leads the way in fighting climate change</a></li><li>- <a href="#">Increasing farm profitability while cutting carbon emissions, a toolkit developed by farmers for farmers</a></li></ul>
<a href="#">Focus Group report</a>	
<a href="#">Mini-papers</a>	

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