Amazing grazing in periods of drought


Crop Production and Engineering Projects Department.
University of Santiago de Compostela
Introduction
Agroforestry
Kyoto Protocol and LULUCF in EU
LULUCF practices within the EU
P3 Conversion
P4 Management
Introduction

Agroforestry

Kyoto Protocol and LULUCF in EU

LULUCF practices within the EU

P3 Conversion

P4 Management
OVERCOMING SHORTAGE PERIODS

Transhumance
Forest grazing

Forage trees:

Leaves and branches (ramón):
- Morus alba
- Robinia pseudoacacia
- Fraxinus excelsior
- Betula alba

Fruit:
- Acorns
- Chestnut
Regulation 1307/2013

Permanent grassland and permanent pasture means land used to grow grasses or other herbaceous forage naturally (self-seeded) or through cultivation (sown) and that has not been included in the crop rotation of the holding for five years or more; it may include other species such as shrubs and/or trees which can be grazed provided that the grasses and other herbaceous forage remain predominant as well as, where Member States so decide, land which can be grazed and which forms part of established local practices (ELP) where grasses and other herbaceous forage are traditionally NOT PREDOMINANT in grazing areas.
Farming: Cropping + Livestock

Greenhouse gas emissions in 2004 by source

SOURCE: IPCC, Working group 1, 2007
IAASTD/Ketil Berger, UNEP/GRID-Arendal
Intergovernmental Panel Climate change assessment:

“Mitigation measures linked to increase food production (e.g., agroforestry or integrated systems) can increase food availability and access especially at the local level.”
Introduction

Agroforestry

Kyoto Protocol and LULUCF in EU

LULUCF practices within the EU

P3 Conversion

P4 Management
AGROFORESTRY

Best tool to

ECOINTENSIFICA

Aboveground  Belowground
Aboveground level

Dupraz and Liagre 2014

40% increase (20-80%)
Aboveground level

Resilience

Drought: Adaptation
Flooding

Biodiversity
Tree lines

20% increasing crop production
AGROFORESTRY

Best tool to

ECOINTENSIFICA

Aboveground  Belowground
AGROFORESTRY

Best tool to

ECOINTENSIFICA

Aboveground  Belowground
Belowground level
Soil Carbon at Three Distances to Cork Oak to 1 m Depth, Mg ha\(^{-1}\)

<table>
<thead>
<tr>
<th>Soil sampling depth (cm)</th>
<th>Whole soil</th>
<th>250-2000</th>
<th>53-250</th>
<th>&lt; 53</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-25</td>
<td>a</td>
<td>b</td>
<td>ab</td>
<td>a</td>
</tr>
<tr>
<td>25-50</td>
<td>b</td>
<td>b</td>
<td>a</td>
<td>b</td>
</tr>
<tr>
<td>50-75</td>
<td>a</td>
<td>b</td>
<td>a</td>
<td>a</td>
</tr>
<tr>
<td>75-100</td>
<td>a</td>
<td>b</td>
<td>a</td>
<td>a</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>g C kg⁻¹ soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 10 20 30 40 50 60</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mg C ha⁻¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 20 40 60 80 100</td>
</tr>
</tbody>
</table>

Soil sampling depth (cm) and whole soil and soil fraction (µm)

<table>
<thead>
<tr>
<th>Depth (cm)</th>
<th>Total C (Mg ha(^{-1}))</th>
<th>Mg C ha(^{-1}) (250-2000 μm)</th>
<th>Mg C ha(^{-1}) (53-250 μm)</th>
<th>Mg C ha(^{-1}) (&lt;53 μm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25-50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50-75</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>75-100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:**
- Letters indicate significant differences at the 0.05 probability level.
Introduction
Agroforestry
Kyoto Protocol and LULUCF in EU
LULUCF practices within the EU
P3 Conversion
P4 Management
Estabilize and Reduce GHG emissions through accountability of emissions and removals from LULUCF (Annex 1)

Article 3

Paragraph 3: conversion

Paragraph 4: land management

EU reduced by 24% GHG emissions between 1990 and 2012

NEW GOAL: 40% by 2030

LULUCF (FOREST AND AGRICULTURAL) WILL BE TAKEN INTO ACCOUNT IN THE KIOTO PROTOCOL ACCOUNTANCY
EU STEPS

Harmonize accounting rules for these emissions and removals across the EU in order to incorporate Agriculture and forestry into the EU’s emission reduction efforts

* **preserve and capture** $\text{CO}_2$ recognizing farmers good practices

* Grassland and cropland management will be included in the accounting (CAP payments)

INCLUDING LULUCF INTO THE GHG MITIGATION FRAMEWORK (Payments: CAP)
Introduction
Agroforestry
Kioto Protocol and LULUCF in EU
LULUCF practices within the EU
P3 Conversion
P4 Management
Introduction
Agroforestry
Kyoto Protocol and LULUCF in EU
LULUCF practices within the EU
P3 Conversion
P4 Management
PARAGRAPH 3: CONVERSION

* AF play a role avoiding deforestation and increasing resilience:

  forest risks: fires!
  wind
Grazing is 10 times cheaper than mechanical clearing

Unwanted vegetation grows worse after grazing
Introduction
Agroforestry
Kioto Protocol and LULUCF in EU
LULUCF practices within the EU
P3 Conversion
P4 Management
PARAGRAPH 4: NO CONVERSION SINCE 1990

Cropland management
Grazing land management
Forest management
Revegetation

Decision 529/2013/EU
Table 1. EU indicative measures that may be included in the information on LULUCF actions submitted pursuant to article 10(2)(d) (Decision 529/2013/EU) and may relate to Agroforestry

<table>
<thead>
<tr>
<th>Measures related to</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cropland management</td>
<td>● Agroforestry</td>
</tr>
<tr>
<td>Grazing management and pasture improvement</td>
<td>● Preventing Grassland to Cropland conversion to native vegetation</td>
</tr>
<tr>
<td></td>
<td>● Increasing productivity</td>
</tr>
<tr>
<td></td>
<td>● Improving nutrient management</td>
</tr>
<tr>
<td></td>
<td>● Introducing more appropriate species, in particular deep rooted species</td>
</tr>
<tr>
<td>Forest activities</td>
<td>● Afforestation and reforestation</td>
</tr>
<tr>
<td></td>
<td>● Conservation of C in existing forest</td>
</tr>
<tr>
<td></td>
<td>● Enhancing production in existing forests</td>
</tr>
<tr>
<td></td>
<td>● Increasing harvested wood products</td>
</tr>
<tr>
<td></td>
<td>● Enhancing forest management (optimize species composition, tending, thinning and soil conservation)</td>
</tr>
<tr>
<td>Preventing deforestation</td>
<td></td>
</tr>
<tr>
<td>Strengthening protection against natural disturbances such as fire, pest and storms</td>
<td></td>
</tr>
<tr>
<td>Substitution GHG intensive energy feedstock and materials with harvested wood products</td>
<td></td>
</tr>
</tbody>
</table>
Agroforestry practices

Silvopasture
Silvoarable
Kitchen gardens
Forest Farming
Riparian buffer strips
<table>
<thead>
<tr>
<th>Silvopasture</th>
<th>Brief description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>19.5 Million ha</strong></td>
<td>Woody + forage <em>and</em> animal production</td>
</tr>
<tr>
<td><strong>10% EU potential area</strong></td>
<td></td>
</tr>
</tbody>
</table>
Advancing Agroforestry on the Policy Agenda
A guide for decision-makers

French National Agroforestry Strategy
Eligibility limited by Regulation 1305/2013

* Permanent grassland and permanent pasture means land used to grow grasses or other herbaceous forage naturally (self-seeded) or through cultivation (sown) and that has not been included in the crop rotation of the holding for five years or more; it may include other species such as shrubs and/or trees which can be grazed provided that the grasses and other herbaceous forage remain predominant as well as, where Member States so decide, land which can be grazed and which forms part of established local practices (ELP) where grasses and other herbaceous forage are traditionally NOT PREDOMINANT in grazing areas.

Where MS not decide so Eligibility:

- Same rules than arable lands (Delegate act 640/2014: 100 trees ha\(^{-1}\))
- Prorata System (LPIS)
Conclusions

• Agroforestry is an excellent tool to combat climate change

• There is a good opportunity to preserve and mitigate climate change and make agricultural systems more resilient through adaptation to climate change
Conclusions

• Adequate design of policies should be delivered in order to take advantage of Agroforestry practices to combat climate change (C increase, storage and stability).
Enjoy reading our latest Newsletter

Tony Simons: "Agroforestry is a 'win-win' for developing nations"

3rd European Agroforestry Conference
23-25 May 2016
Celebrating 20 years of Agroforestry research in Europe

Save the date!

Presentations of the Sessions and Book of Abstracts are Available here

Agroforestry has been included in the European Parliament reports on "Technological solutions for sustainable agriculture in the EU" and "Enhancing innovation and economic development in future European farm management"

Agroforestry has been included in the European Commission final paper on "A strategic approach regarding the European agricultural research and innovation"
Countries with national associations members of EURAF

Newsletter N°16, March 2016

1. EURAF ACTIVITIES
2. REGIONAL AGROFORESTRY NEWS
   2.1 Agroforestry Association in Sweden (Agroforestry Sverige)
   2.2 Pastoralism and Fire Prevention in Spain
3. FEATURED FARM: "Red Tractor Farm", Kea, Greece
4. FOCUS GROUP ON AGROFORESTRY
5. ASPEN AGROFORESTRY
6. EU CONSULTATION ON GREENING
7. MISCELLANEOUS
AGFORWARD (www.awforward.eu)
Agroforestry for Rural Development Promotion

AFINET (2017-2019)
H2020 THEMATIC NETWORK: Agroforestry Innovation Network
Thanks!!

mrosa.mosquera.losada@usc.es