



BIKE

BIOFUELS PRODUCTION
AT LOW - ILIUC RISK
FOR EUROPEAN SUSTAINABLE
BIOECONOMY



Certification schemes for energy crops and good practices from the field CASE UPM Biofuels

Online webinar 7/12 at 10:30 AM CET

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UPM Biofuels business in a nutshell



ADDITIONAL SUSTAINABLE BIOMASS

Sustainable and uniquely upstream integrated feedstock pool

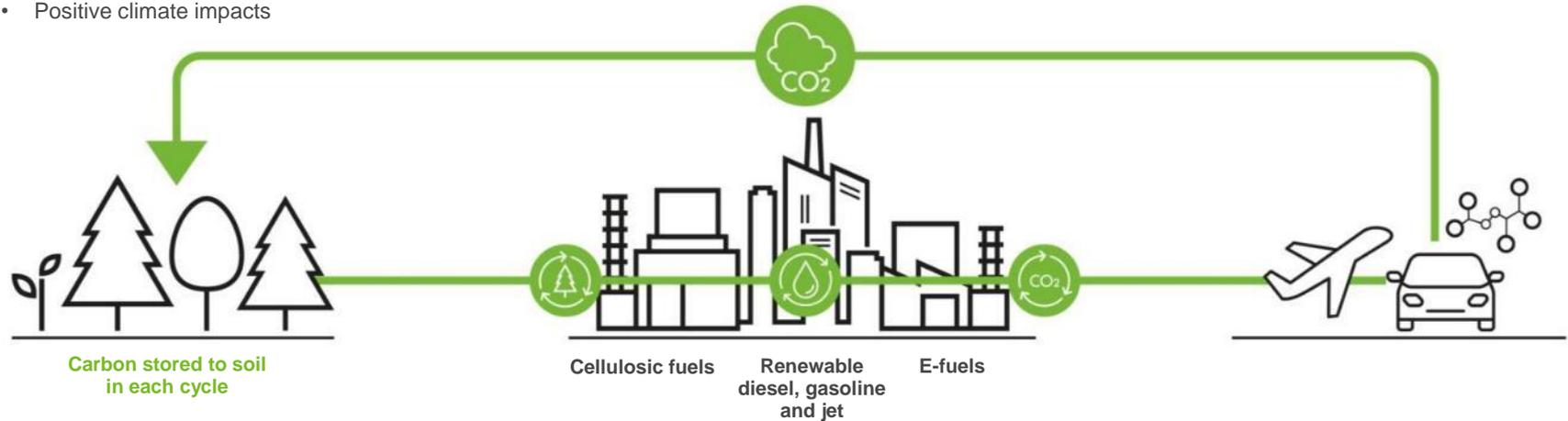
- Additionality
- Positive climate impacts

TOWARDS CLIMATE POSITIVE FUELS

Efficient low carbon footprint production facilities

DECARBONIZED TRANSPORT AND PETROCHEMICALS

Flexibility to create maximum value from several end uses and market geographies



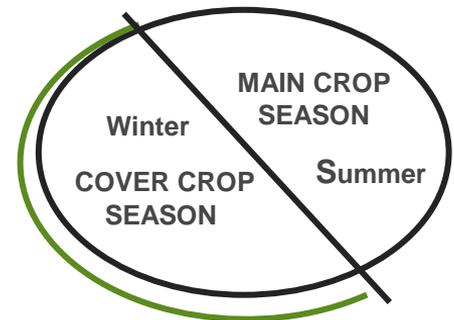
Towards climate positive farming



- Additional biomass outside main cultivation season - no impacts on land-use (direct or indirect)
- Higher rates of carbon sequestration to soil
- Improved soil productivity
- High GHG-reduction from sustainable farming

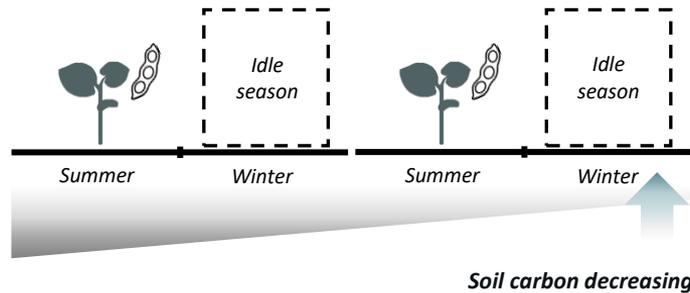
→ **Additional sustainable feedstock for producing biofuels**

*Productive cover cropping
takes an unproductive
period into use*

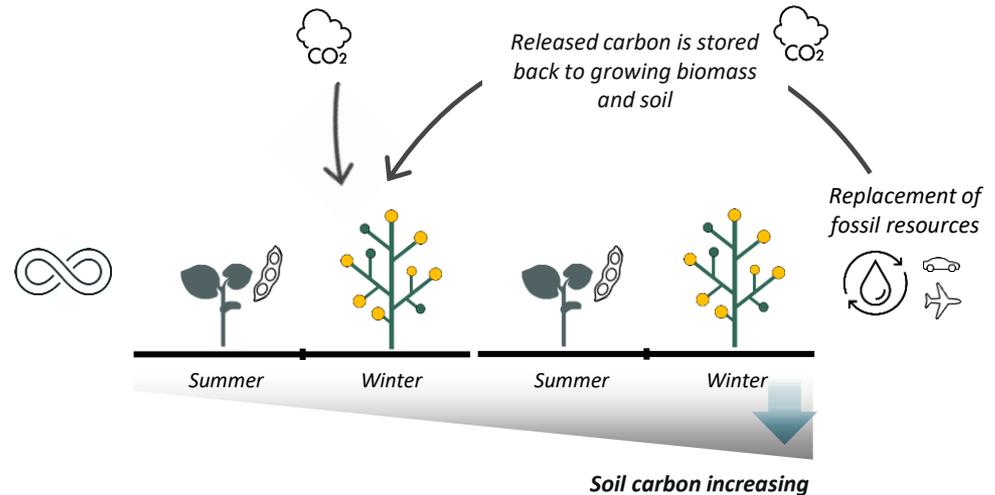


Sustainable land use concepts for additional sustainable biomass and improving soil carbon balance

Intense farming with no diversification in crop rotation can lead to soil depletion



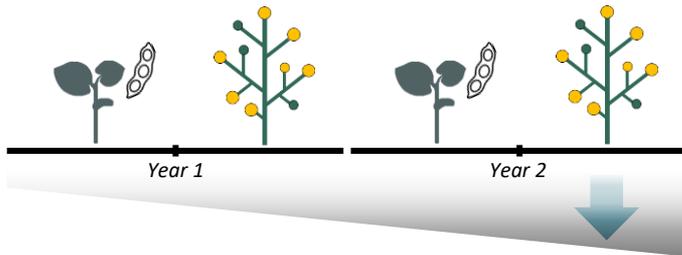
Rotation with productive cover crops creates new sustainable biomass



Adoption of sustainable soil management practices is in the core of regenerative farming system



CARBON FARMING



Additional biomass



Positive soil carbon balance and soil health

MANAGEMENT PRACTICES

Introduction of an **additional cover crop** to the existing crop rotation, in areas and during seasons where the **land is not in productive use**

Internal carbon inputs into soil

- Cover cropping
- High biomass crop development
- Diversification of crop rotation / crop planning

External carbon input into soil

- Biochar, manure

Minimizing soil disturbance

- Minimum or no tillage

POTENTIAL BENEFITS

Climate change mitigation

Carbon sequestration
Increased biodiversity
Reduced soil erosion
Improved soil and water quality

Low iLUC risk

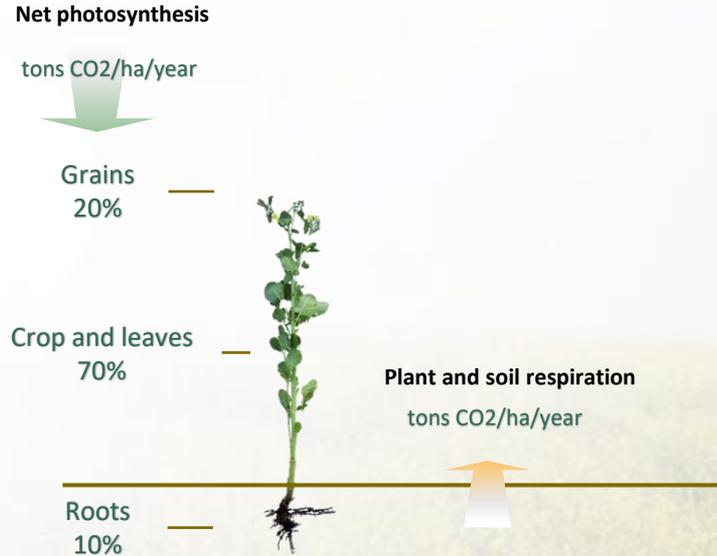
Additionality

feedstocks (oil, protein)
Additional income
Increased yields and productivity
Higher nutrient retention and recycling



Higher rates of carbon bio-sequestration

Illustrative figures



Carbon stored in soil by crop residues

+1.5 tons CO₂/ha/year

By improved field practices

+1,5t/ha/year

Farming concept in Uruguay

- Typical rotation
 - Summer crops are soybean and maize
 - Winter crops in three years rotation (barley, wheat, non-productive cover crop)
- Introduction of an additional productive cover crop to the existing crop rotation
 - Replace non-productive cover crop with Brassica oil crops (for every 3rd winter-season)
- Existing certification
 - RSB EU certified feedstock for biofuel



Piloting low iLUC risk certification Additionality



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Biomass produced from productive cover cropping is additional to the output provided by the existing cropping system on the same agricultural land.

- Additional oil grain (Brassica oil crops) yields between 1500 kg/ha - 2700 kg/ha
- Additional residual biomass left to the field is 6000 to 10 000 kg/ha
- Additional protein from harvested grain
 - 42% oil for biofuel production
 - 58% meal for food and feed



Key findings and suggestions



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Discussion

A way forward

Additionality

Setting the dynamic baseline to proof additionality is more complex in long rotations

More detailed guidelines and regional approach that considers the different concept holistically

Auditing practices

Financial barrier analysis is difficult to build in the cases with existing agricultural rotation

No “benefit” for the operator to do low iLUC.

Modified financial barrier analysis for different cases

Auditing need to be combined with additional benefit as a voluntary add on part of other sustainability audits

Soil carbon

Soil carbon measurements and modeling for improved practices and external carbon(biochar) requires more clarity

Stronger incentives for low iLUC –risk certification is needed

UPM **BIOFORE**
BEYOND FOSSILS

