

Increasing crop  
productivity and  
cultivating crops in  
unused/marginal land:  
state of play and  
options to grow low ILUC  
risk feedstocks for  
biofuels

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**Raising awareness,  
delivering solutions.**



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## Context

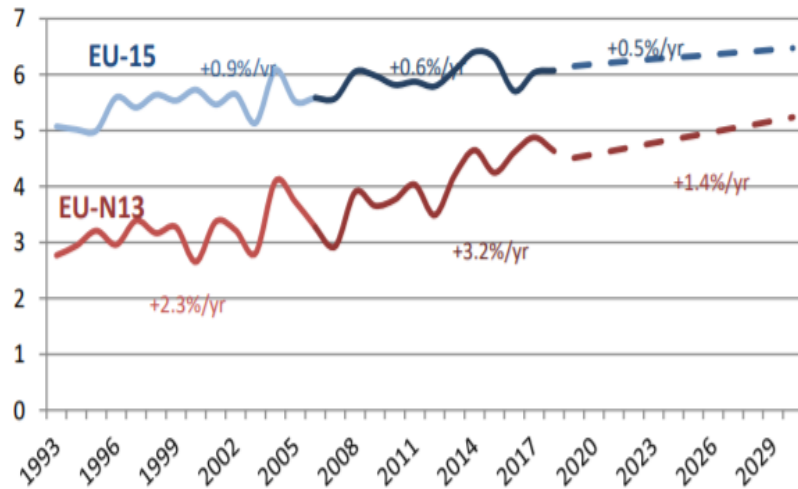
- REDII mandates that after the 31/12/23 the use of high ILUC risk biofuels will gradually decrease to zero (high ILUC risk fuels being those produced from food or feed crops for which a significant expansion of the production area into land with high carbon stock is observed).
- The Directive also introduces the low-ILUC risk biofuels, bioliquids and biomass fuels defined as those produced from feedstocks that avoid displacement of food and feed crops through:
  - Crop yield increase through improved agricultural practices (cover cropping, rotation) or
  - Though cultivation of areas not previously used for crop production (cultivation of non-food crops on unused, degraded or abandoned land).

## Agricultural practices

- ✓ Intercropping: crop grown amidst a main crop or in between the planting rows of that main crop and intended to be harvested or to be supportive to the harvest of the main crop.
- ✓ Rotational cropping (including cover crops): temporal alternation of different crop types (mown vs. lifted, monocots vs dicots, annual vs perennial) on a piece of farmland.
- ✓ Agroforestry: the tending of livestock or growing of food crops on land that also grows trees for timber, firewood, or other tree products. It includes shelter belts and riparian zones/buffer strips with woody species.

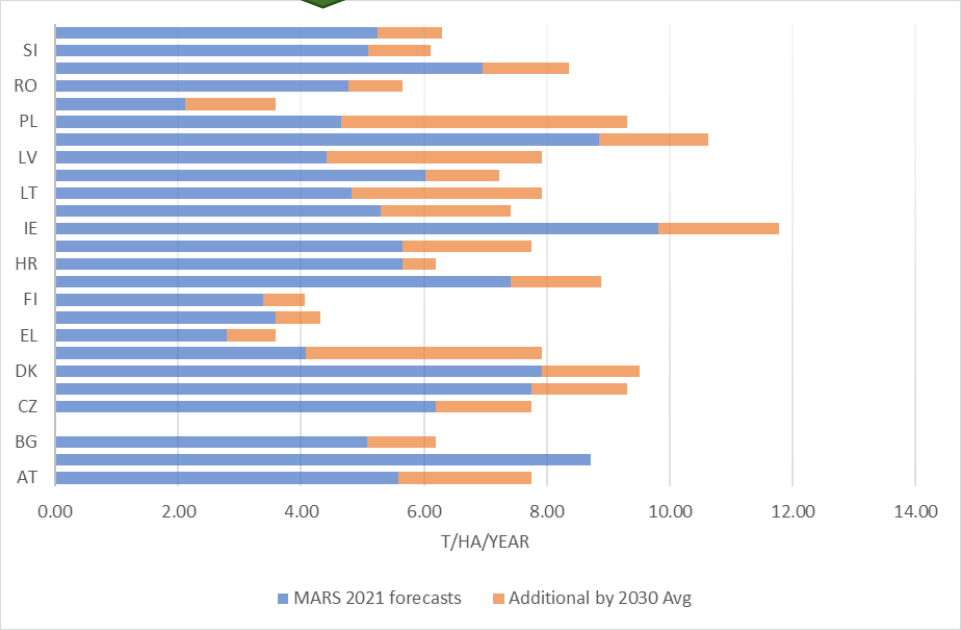
# Figure with crop yield increases

Figure 7: Total cereal yield outlook (t/ha)

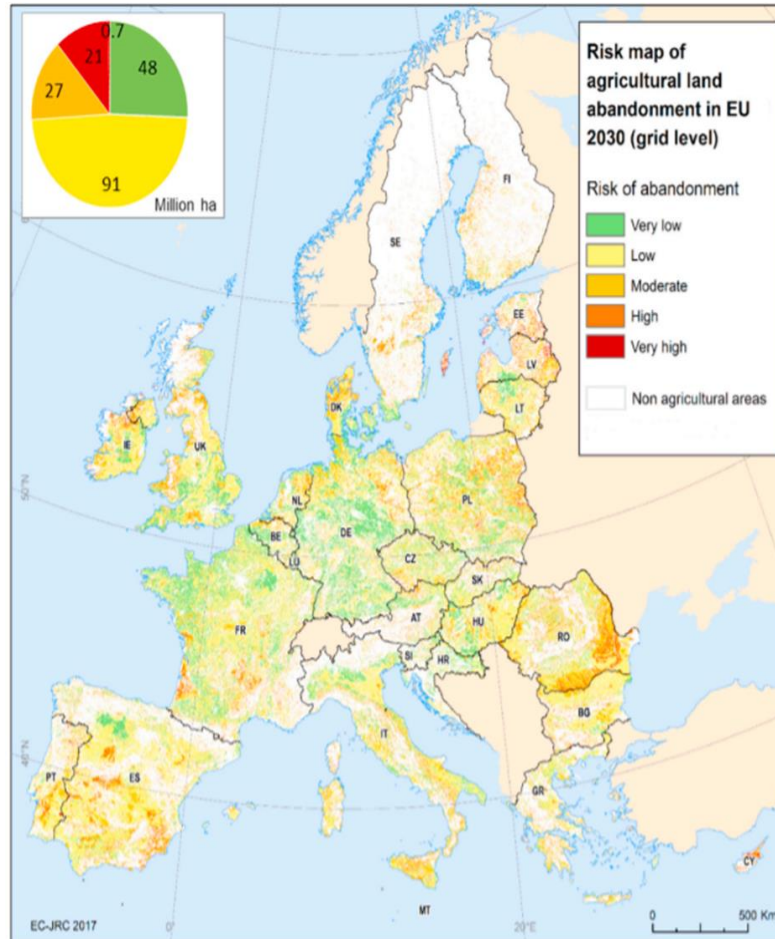


Source: DG Agriculture and Rural Development

With sustainable productivity increases (crop traits, agricultural practices, yield increase in underperforming regions) up to 30% increase in soft wheat average EU27 yields by 2030.



## Land abandonment



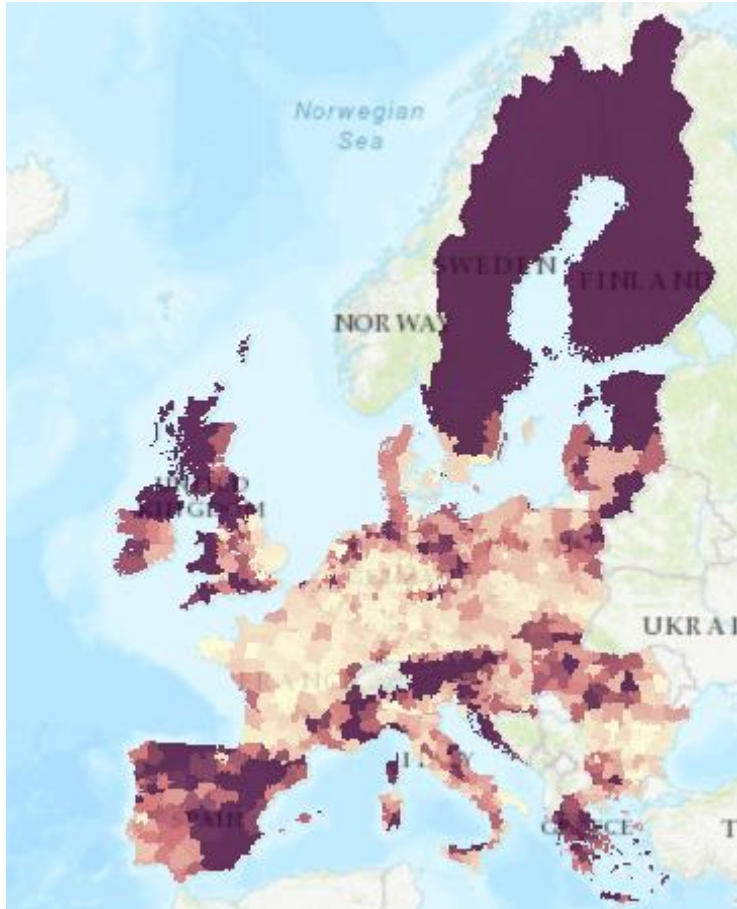
### *JRC potential risk of agricultural land abandonment in 2030*

- over the period 2015-2030 the net conversion of agricultural land to abandonment amounted to around **4.8 million ha**

Castillo, P. et al. 2021;

[10.1016/j.envsoft.2020.104946](https://doi.org/10.1016/j.envsoft.2020.104946)

## Marginal land



*Approximately 62 million ha of land in EU27 & UK is estimated as marginal*

<https://magic-h2020.eu/>

<https://iiasa-spatial.maps.arcgis.com/apps/webappviewer/index.html?id=a813940c9ac14c298238c1742dd9dd3c>

## Marginality challenges are not always the same

### Low soil carbon

- Around 45 % of the mineral soils in Europe have low or very low organic carbon content (0–2 %) and 45 % have a medium content (2–6 %)

### Soil contamination

- 2.5 million potentially contaminated sites across Europe
- the most frequent contaminants are mineral oils and heavy metals

### Soil erosion

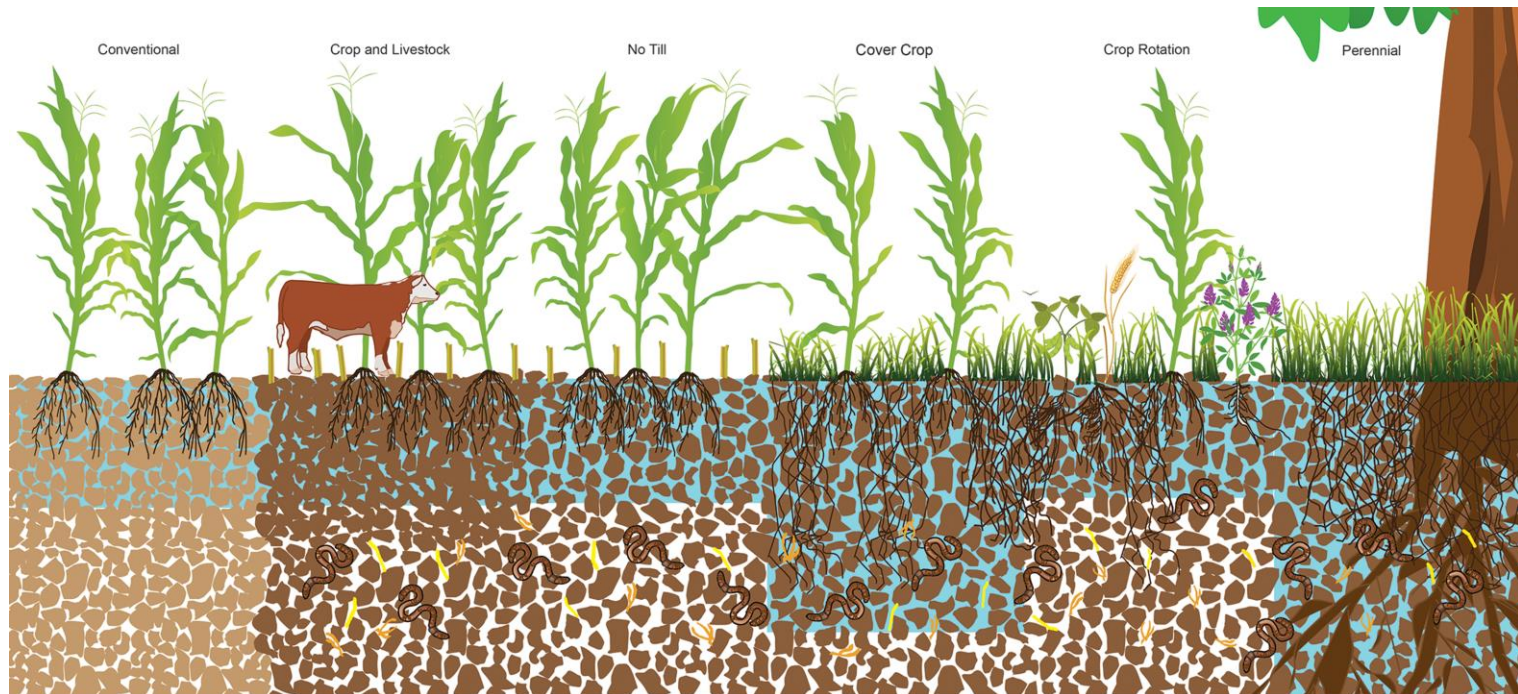
- In 2016, over 80 % of all areas in the EU-27 estimated to be affected by moderate to severe soil erosion were agricultural areas and natural grassland
- eroded soil may lose 75 % - 80 % of its carbon content

### Dryness

- The area affected by growing season soil moisture deficits increased by 80 %, from an estimated 800 000 km<sup>2</sup> in 2017 to 1.45 million km<sup>2</sup> in 2019

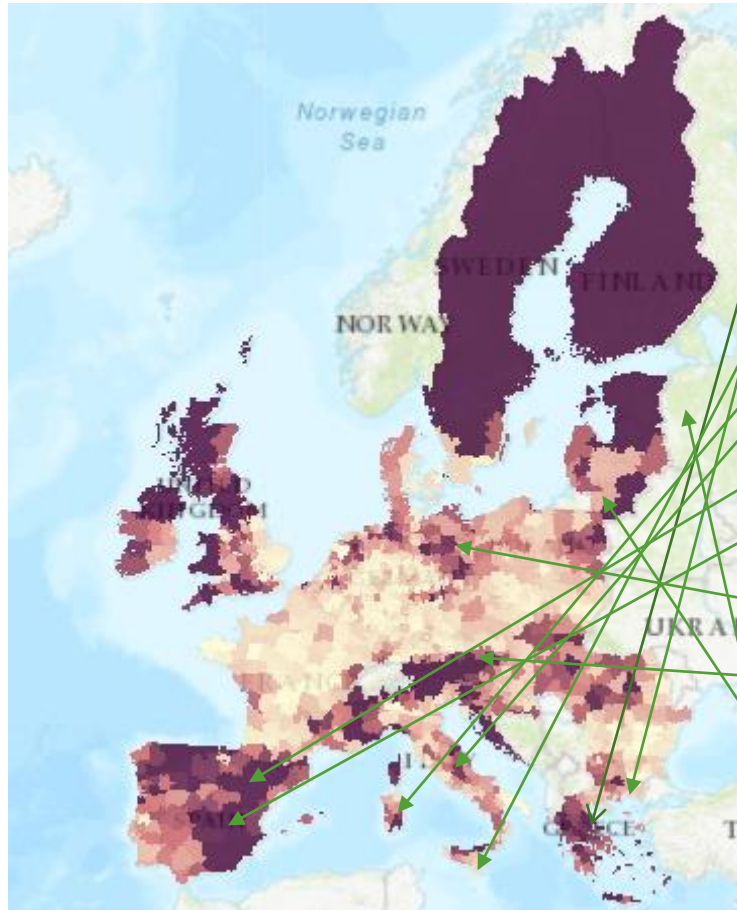


# Specific agricultural practices and perennial species improve low quality land



Comparing infiltration rates in soils managed with conventional and alternative farming methods: A meta-analysis  
Andrea D. BascheMarcia S. DeLonge

# Good Practices- crops in marginal land

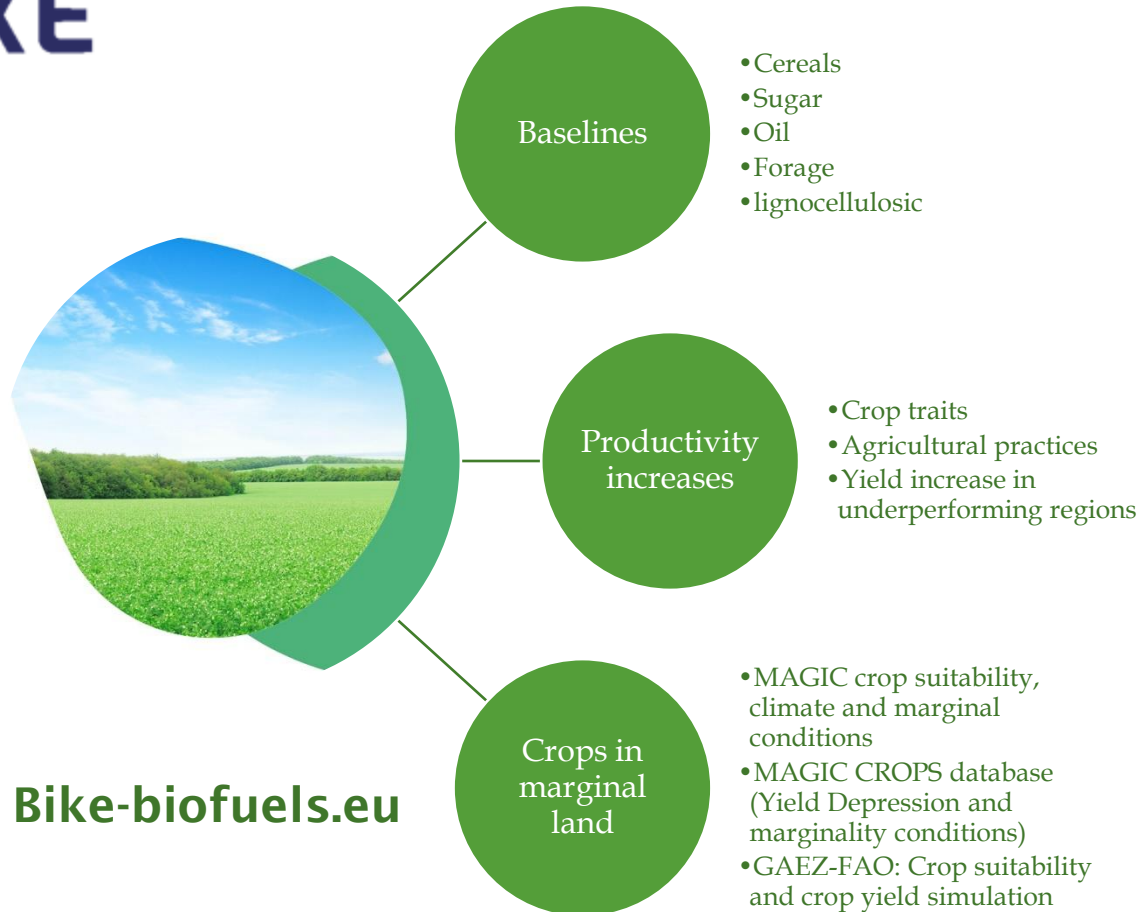


| Region                              | Crop(s)                             | Low soil carbon | Soil contamination | Soil erosion | Dryness |
|-------------------------------------|-------------------------------------|-----------------|--------------------|--------------|---------|
| <b>Greece</b>                       |                                     |                 |                    |              |         |
| Central Greece                      | switchgrass, giant reed             | Red             | White              | Yellow       | Yellow  |
| East Macedonia/ Thrace              | black locust, sunflower             | Red             | White              | Red          | Green   |
| <b>Italy</b>                        |                                     |                 |                    |              |         |
| Catania                             | switchgrass, giant reed, miscanthus | Red             | White              | Yellow       | Yellow  |
| Sardinia                            | cardoan                             | Red             | Red                | White        | Red     |
| Central Italy, Lazio                | poplar                              | Yellow          | Red                | Green        | Yellow  |
| <b>Spain</b>                        |                                     |                 |                    |              |         |
| Soria, Castilla y Leon              | Rye, tall wheatgrass                | Red             | White              | Yellow       | Red     |
| Castilla-La Mancha, Cuenca province | lavender                            | Red             | White              | Green        | Yellow  |
| <b>Germany</b>                      |                                     |                 |                    |              |         |
| Brandenburg                         | black locust                        | Red             | White              | Red          | White   |
| <b>Hungary</b>                      |                                     |                 |                    |              |         |
| Észak-Magyarország                  | black locust                        | Red             | White              | Yellow       | White   |
| <b>Latvia</b>                       |                                     |                 |                    |              |         |
| Skriveri, Central Latvia            | reed grass, canary festulium        | Red             | White              | Yellow       | Red     |
| <b>Ukraine</b>                      |                                     |                 |                    |              |         |
| Volynska and Lviv (West Ukraine)    | willow                              | Red             | White              | Red          | White   |
| Kyiv Oblast                         | miscanthus                          | Red             | Yellow             | Red          | White   |

## New analysis in preparation



# BIKE





Thank you

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### Project Partners



[www.etipbioenergy.eu](http://www.etipbioenergy.eu)



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