

Midas

MARGINAL LANDS, INDUSTRIAL CROPS
AND INNOVATIVE BIO-BASED VALUE CHAINS



ALMA MATER STUDIORUM
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Strip-intercropping of non-food crops on marginal land: preliminary results from the MIDAS project

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To produce enough food for a growing population in a sustainable and inclusive manner while responding to increased demand for renewable materials, strengthening resilience to climate change and respecting planetary boundaries, is the major societal challenge of the 21st century. New biomass sources which have low or no Indirect land Use (iLUC) effects need to be found. One of the options to avoid ILUC is growing non-food crops on marginal, abandoned and degraded lands as has already been envisaged in the EU Recast Renewable Energy Directive RED II.

In this scenario, the MIDAS project (Marginal agricultural land and climate-resilient and biodiversity-friendly industrial crops for innovative bio-based value chains) was funded by the EC, involving 29 partners from 16 different countries, including both EU and non-EU states.

UNIBO is the work-package leader of WP3 “Case-studies on innovative low-ILUC cropping systems to source feedstock for the biobased industry”. Two different cropping systems have been selected as the most feasible to source low iLUC feedstock from marginal land: i) strip intercropping with annual and herbaceous perennial species, ii) agroforestry systems including annual and woody species.

UNIBO is carrying out researches on the first system. At this scope, a large field trial of about 1 ha has been established in January 2023 in Ozzano dell’Emilia (Bologna, Italy) in a field characterized by a sand content > 65% and a slope ranging from 8 to >15% depending on the part of the field. Three annual crops, namely: crambe (*Crambe abyssinica*), industrial hemp (*Cannabis sativa*), and safflower (*Carthamus tictorius*), have been planted in large replicated strips of about 1000 m² each (Fig. 1). The annual crops have been intercropped with the perennial biomass crop: miscanthus (*Miscanthus x Giganteus*). While the annual crops have been established by seeds, for miscanthus rhizomes have been used for the establishment



Fig. 1a, b. View of UNIBO trials (Credits: ETA Florence)

All crops were established between mid-January (safflower) until mid-April (Miscanthus) 2023, accordingly to their specific environmental needs. The first growing season has been characterized by abnormal weather conditions, with a quite dry late winter/early spring, and very high precipitation in the second half of May, in which more than 300 mm (about half of the annual cumulative precipitation for the test site) of rain felt on the soil in less than 15 d. Despite these conditions, the all the annual crops were able to establish quite well and produce satisfactory seed/biomass yields (Fig. 2), while miscanthus establishment resulted difficult so far.

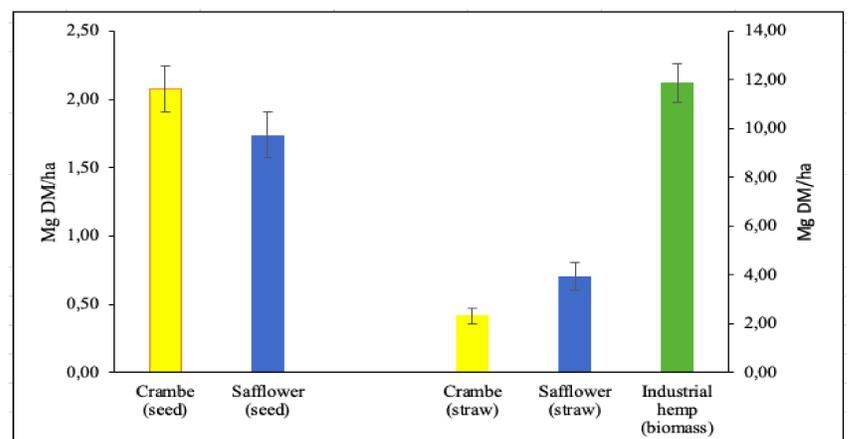


Fig. 2. Average productivity of safflower, crambe and industrial hemp



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Funded by the European Union

This project has received funding from the European Union's Horizon Europe Research and Innovation Programme under Grant Agreement No. 101082070.

