Marginal lands for Growing Industrial Crops

D3.1 – Panel of advanced breeding lines from different industrial crops adapted to different marginal conditions

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R	Document, report	☐	**PU**	Public	■
DEM	Demonstrator, pilot, prototype	☐	**CO**	Confidential, only for members of the consortium (including the Commission Services)	☐
DEC	Websites, patent fillings, videos, etc.	☐			
OTHER		■			

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During the first reporting period a set of varieties of the lignocellulosic crops miscanthus and hemp as well as of the oil crops crambe, camelina, and calendula have been chosen for testing in WP4 based on their performance in previous projects. Field trials of these varieties under marginal conditions have now started and some preliminary results suggest that some of these lines are promising for cultivation under a different set of suboptimal agricultural conditions.

1. Miscanthus: eight miscanthus hybrids (*M. sinensis* x *M. sinensis*) developed by Wageningen University (WU) are being tested across seven marginal environments in Europe characterized by different marginality factors (sandy, sandy-loam, silt-clay, heavy-clay soils; heavy metals contamination, hydrocarbons contamination; abandoned areas; hilly areas). From preliminary observations the performance of the eight hybrids is overall good in terms of establishment (always above 65% since the first year), growth parameters (timing of flowering and senescence), and amount and quality of biomass production. Nonetheless, lines GRC-5 and GRC-7 seem to be out-performing across all the environments tested. Line GRC-5 displays particularly delayed flowering and largest panicle length and canopy height, all traits that lead to high biomass production. Line GRC-7 shows early flowering and senescence, two traits that are associated with better translocation of nutrient to the rhizomes and thus a lower need of inputs to support crop growth in the next season (which is a good characteristic for cultivation on marginal lands).
2. Hemp: UHOH has set up field trials of the variety Markant in 2018. A wide set of traits is assessed, including plant height, plant density, fresh and dry biomass yield, shoot/leaf/grain proportion of fresh biomass yield, mineral content of dry biomass, fiber content and composition, and oil quality. Preliminary results suggest that this variety seems to adapt well to marginal environments (hilly areas), as the dry matter yield observed is in line with data reported in literature under standard conditions of cultivation.
3. Crambe: Cultivar Galactica has been grown under marginal conditions at University of Bologna (UniBo) and CRES. Results of the trials need to be analysed.
4. Camelina: A new cultivar has been grown under marginal conditions at UHOH. Results of the trials need to be analysed.
5. Calendula officinalis: Seeds of the variety Carola have been delivered to UHOH. Field trials have been executed on areas at higher altitude in Germany and results are under analysis.