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BEST-CROP: an EU-funded project to deliver novel crops with enhanced photosynthesis and tailored straw for the circular economy

Funded by the European Union's **Horizon Europe** Research and Innovation Programme under the topic *HORIZON-CL6-2022-CIRCBIO-02-02-two-stage*, the BEST CROP project (Boosting photosynthesiS To deliver novel CROPs for the circular bioeconomy) capitalizes on ground-breaking technologies to improve the photosynthetic properties and ozone assimilation of barley and deliver novel crops with tailored straws for industrial uses. To achieve these ambitious targets, the **University of Milan** lead a multidisciplinary alliance of 18 European plant breeding companies, straw processing companies and academic plant scientists aiming to use the major advances in photosynthesis to improve barley yield and to exploit the variability of barley straw quality and composition.

BEST-CROP targets **barley**, a major crop worldwide, with the European Union producing the largest share (almost 55 Mt grain/yr) and an almost equivalent amount of straw covering about 10% of EU arable land – aiming to:

- **Mitigate ozone air pollution extremes during drought:** by providing a strategy of air phytoremediation through the modulation of stomatal conductivity for ozone without a negative effect on drought tolerance and yield;
- **Address the global food security crisis:** by delivering highly productive barley breeding lines thanks to optimized photosynthesis features. Furthermore, barley represents an optimal model species for other cereals with a view to project medium-term replicability;
- **Boost the growth of the circular bioeconomy:** tailoring of barley straw for efficient transformation into high-value bio-based compounds and materials that replace products currently obtained from high-polluting industrial sectors with high dependency on non-renewable energy sources, with a focus on the feed and building sectors.

Acknowledging and respecting the current position of EU legislation on genetically engineered crops, BEST-CROP will drive forward based on highly innovative biotechnology and science that exploits natural- and induced-genetic variation. Nevertheless, BEST-CROP also exploits gene editing techniques providing barley genetic materials that could be exploited directly in breeding programs soon or serve as proof-of-concept of gene function.

With a total funding of almost 6 million €, the BEST-CROP project is expected to start in July 2023 and end in June 2028.



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