



**cousin**

Crop Cousins, promise for the future

Practice Abstract n. 11

# Pilot cultivation of Kernza® in Spain

## Lessons learned for future COUSIN trials



### Introduction

*Kernza® (*Thinopyrum intermedium*), a perennial grain crop derived from a wild relative of wheat, offers multiple environmental benefits such as nitrate leaching reduction, soil carbon sequestration, and forage provision. Kernza® exemplifies how CWRs can be harnessed to develop innovative perennial crops. First results provide a baseline that will directly inform the design and management of upcoming COUSIN field trials.*

### Objectives

Pilot trials conducted by CT BETA in Catalonia (2020-2023) aimed to take the first steps in the agronomic cultivation and practical use of Kernza® under Mediterranean conditions. The main objective of the pilot cultivations was to assess Kernza®'s agronomic and environmental performance in Mediterranean systems, where water scarcity and nitrate pollution are critical challenges. Trials in commercial farms evaluated crop establishment,

forage and grain potential, root, biomass development, and soil parameters. Specific aims included testing sowing timing (spring vs. late summer), weed management strategies, and the feasibility of dual-purpose use (forage + grain). These first experiences generated critical baseline knowledge that now prepares the ground for COUSIN field experiments, where the potential of CWR-derived crops such as Kernza® will be further explored.



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## Results

Kernza® establishment was highly variable, strongly affected by sowing date and weed pressure. Trials showed that late-summer sowing combined with early weed control enabled good establishment, up to ~80% soil coverage and strong regrowth capacity. Forage quality analyses indicated standard nutritional values, though delayed harvest reduced digestibility. Average yields reached ~700 kg grain/ha and ~1030 g biomass/m<sup>2</sup> depending on crop age. Increases in root biomass over time were linked to higher soil organic matter and carbon in the 0–30 and 30–60 cm layers, with carbon gains detectable down to 60 cm depth after three years of growth. These results highlight Kernza®'s long-term potential to improve soil quality and carbon storage.

## Recommendations

For successful cultivation in Mediterranean conditions, Kernza® should be sown in late summer on well-prepared seedbeds with effective early weed control. Under these practices it can provide modest grain yields and reliable forage production, though harvesting machinery adapted to its small seeds is still required. Beyond productivity, Kernza®'s perennial root system improves soil organic matter and carbon storage, offering valuable contributions to sustainability and climate change mitigation. This dual role—as a productive crop and provider of ecosystem services—illustrates how a crop wild relative can evolve into a novel cultivated species. The lessons gained will directly support COUSIN trials, where management and benefits will be further tested with farmers and stakeholders.

## Further reading

- DeHaan LR & Ismail BP (2017). Perennial cereals provide ecosystem benefits. *Cereal Foods World*, 62(6): 278–281.
- Ginot C., Bathellier C., David C., Rossing W., Celette F., et al. (2024). Introducing intermediate wheatgrass as a perennial grain crop into farming systems: insights into the decision-making process of pioneer farmers. *Agronomy of Sustainable Development* 44:58. <https://doi.org/10.1007/s13593-024-00993-1>
- Kernza® website: <https://kernza.org>

