

New white lupin cultivars for organic farming in Italy



Figure: Line '6.65' (near maturity) that featured good grain yield, farmers' appreciation, 'sweet' seeds, and high winter survival in northern Italy (Photo: Luciano Pecetti, CREA)

OBJECTIVE

White lupin is a grain legume with increasing interest for European cropping systems as a food or feed crop. There is scarcity of cultivars adapted to the Italian growing conditions and to organic farming. We aimed, therefore, at selecting and making available white lupin cultivars suitable for organic cultivation in diversified Italian environments. The genetic basis used for the selection activity derived from a set of crosses between agronomically outstanding landraces (with bitter seeds) and sweet-seed breeding lines. Care was taken to discard bitter-seed progenies during the selection process.

RESULT

A set of promising lines deriving from the available genetic basis were evaluated in an organic farm in northern Italy. One line stood out for its good grain yield, farmers' visual appreciation, very low amount of bitter alkaloids in the seed and high winter survival, being a potential candidate for registration as variety suitable for organic farming in Italy.

In parallel, an evolutionary population (EP) obtained in northern Italy from the same genetic basis was let evolve for three generations (seasons) in south Sardinia under local conditions. Farmers' selection by visual choice of the best plants was also carried out for two seasons. Compared to other germplasm, the farmer-selected EP had a yield advantage and greater visual appreciation by farmers who visited the trial, but attention should be paid for any possible inadvertent selection of seed bitterness. A notification of the best EP as OHM adapted to Mediterranean environments is envisaged.

RECOMMENDATIONS

- Registration/notification of the new cultivars (one pure line; one OHM) followed by their licensing to seed companies operating in the organic sector.
- New cultivars presented and promoted through organic farming associations/networks in addition to the involved seed companies.
- Care to preserve the sweet-seed character of the new cultivars, by preventing any undesired cross pollination during their multiplication with bitter landraces or commercial cultivars deploying different alkaloid genes, and monitoring periodically the seed bitterness of the OHM after its notification.



ADDITIONAL INFORMATION

Annicchiarico, P., Mameli, L., Petitti, M. et al. Crop yield and quality of locally selected evolutionary populations, elite breeding lines, and commercial varieties of white lupin in two European regions. *Euphytica* 222, 112 (2026). <https://doi.org/10.1007/s10681-026-03757-y>.

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Co-funded by
the European Union

Funded by the European Union, the Swiss State Secretariat for Education, Research and Innovation (SERI contract number 22.0412) and UK Research and Innovation (UKRI). Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or REA, nor SERI or UKRI.



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