



<b>Deliverable title</b>	<b>D3.4 Recommendations and guidelines on sustainable production of thistle crops in the Mediterranean basin</b>
<b>Deliverable Lead:</b>	ISA-CM
<b>Related Work Package:</b>	<b>WP3 Sustainable cultivation of thistles</b>
<b>Related Task:</b>	<b>Task 3.3 Soil characterization. Task 3.5 Phenological development survey. Task 3.6 Analysis of the above ground fresh and dry biomass</b>
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<b>Abstract</b>	Guidelines for sustainable cultivation of thistle crops in the Mediterranean basin are reported in this Deliverable.

## Versioning and Contribution History

<b>Version</b>	<b>Date</b>	<b>Modified by</b>	<b>Modification reason</b>
v1.0	15.10.2022	Bouthaina Dridi Al Mohandes	First version
V2.0	30.10.2022	Bouthaina Dridi Al Mohandes	Comments after peer reviewing process

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# 1. Recommendations and guidelines on sustainable production of thistle crops in the Mediterranean basin

## STEP 1: Greenhouse material production:



- Seeding in the autumn-winter months in a protected environment (heated greenhouse at an average temperature of 20°C) and use of a soil substrate for sowing (at least 50% peat is recommended) in pots (16 cm in diameter) in which all compared species (*Cynara humilis* L., *Cynara cardunculus* L., *Onopordum tauricum* Willd. and *Onopordum platylepys* Murb.) are to be placed;
- three-weekly irrigation (according with Zenobi et al. 2021).

## STEP 2: Transplanting ad open field Cultivation



- Seedbed preparation: ploughing at 45 cm depth with subsequent arrowing all aimed at having well-drained and structured soil.
- Fertilisation: organic fertilisation (optional) before the main tillage (ploughing).
- Field transplanting: takes place in the phenological phase of third and fourth true leaf (BBCH stages according with Archontoulis et al. 2010): with a view to flower head production (Zenobi et al. 2021), recommended planting density 1 m × 0.5 m for *Cynara cardunculus* L. (perennial species) and 1 m × 1 m for

*Onopordum tauricum* Willd. which behaves as an annual or at most biennial species.

- Emergency Irrigation (optional) concentrated in the post-transplanting phases
- Mechanical or phisical weed control on the inter-row in the post-transplanting phases.