



AGROECOLOGY FOR WEEDS

www.goodhorizon.eu

AGROECOLOGICAL WEED MANAGEMENT REPOSITORY

The Agroecological Weed Management (AWM) Repository

<https://www.goodhorizon.eu/platform/awm-practices/>

is a virtual space where you can freely and openly find information and educational material on current and agroecological weed management practices in the European Union. You can browse and learn about several weed management practices and crops.

The **Agroecological Weed Management (AWM) Toolbox**, our Decision Support System that supports the user to reduce the use of synthetic herbicides and/or improve weed management by combining different Agroecological Weed Management (AWM) strategies with cover crops is LIVE !

<https://dss.goodhorizon.eu/>



#@Agroecology is GOOD

Version 2.0 – June 2026



24

ROBOTS (MECHANICAL WEEDING)

DESCRIPTION & BENEFITS

Robots for mechanical weeding are autonomous or semi-autonomous field machines that combine navigation systems, cameras or other sensors, crop-weed recognition and detection algorithms, and mechanical weeding tools (such as hoes, knives, blades, brushes, discs, finger weeders, rotary tools). They are used for inter-row weeding, and in more advanced systems with high precision for intra-row weeding to:

- **support timely weed control** when weeds are still small and easier to manage
- **reduce labour demand and the need for repetitive hand weeding**, especially in cash crops and organic systems
- **increase precision** compared with conventional mechanical weeding
- **reduce soil compaction** when lightweight robotic platforms are used instead of repeated passes with heavy machinery
- **generate useful field information on weed distribution, treated areas and crop rows**

STRENGTHS

- Targeted non-chemical weed control, supporting organic, low-input and integrated weed management systems
- Higher precision than many conventional mechanical weeding tools, especially when cameras, artificial intelligence and accurate navigation allow tools to work closer to crop rows avoiding crop injuries
- Reduction of manual weeding labour, particularly in vegetables, organic systems and other crops where hand weeding is costly or difficult to secure

OPPORTUNITIES

- Support for farms aiming to reduce reliance on herbicide use, respond to herbicide resistance, and transition towards more agroecological weed management strategies
- Rental and sharing machinery opportunities can make the technology more accessible to farms that cannot afford direct purchase
- Integration with digital tools such as Decision Support Systems can improve monitoring, targeted interventions and long-term weed management

WEAKNESSES

- High initial investment costs for the robot, sensors, software, batteries, maintenance, spare parts and technical support
- Requires technical knowledge, operator training and regular calibration to ensure accurate weed detection, crop protection and effectiveness
- Performance depends strongly on field conditions such as soil moisture, stones, residues, uneven ground, canopy,, weed growth stage, and weed density

THREATS

- Technology failures (e.g., repairs, lack of technical support) during narrow weeding windows may lead to serious weed competition
- Unequal access may favour larger farms (i.e., better financial capacity) if costs remain high and shared service models are not available
- Wrong operations (e.g., excessive speed or unsuitable soil conditions) could increase crop injury and/or soil disturbance

TIPS

- **carefully select the robot type and model** as some systems are suitable mainly for inter-row weeding, while intra-row weeding requires much higher precision
- **operate when weeds are small** before they become well rooted or highly competitive
- **maintain, upgrade, and calibrate the robot before use** to ensure better results (e.g., cameras, row width, working speed, detection settings) & train operators in safety, troubleshooting and field assessment
- **test the robot first on a small representative strip** and check weed removal, crop injury and soil disturbance before treating the whole field
- **operate under suitable soil conditions** avoiding very wet, sticky, crusted or stony soils
- **reduce speed** when crop spacing is narrow, weed density is high, the crop is small, or high precision is needed
- **monitor results after each pass** by checking missed weeds, crop injury, soil disturbance and weed regrowth
- **evaluate whether purchase, shared ownership, rental or other possibilities** are most appropriate for your farm

LIABILITY DISCLAIMER

This is the second version of the AWM repository released in April 2026. While every effort has been made to ensure the accuracy and reliability of the information provided in this factsheet, we make no representations or warranties of any kind, express or implied, about the completeness, accuracy, reliability, suitability, or availability of the information contained herein for any purpose. Any reliance you place on such information is therefore strictly at your own risk. In no event will we be liable for any loss or damage, including without limitation, indirect or consequential loss or damage, or any loss or damage whatsoever arising from loss of data or profits arising out of, or in connection with, the use of this factsheet.