



AGROECOLOGY FOR WEEDS

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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.

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DRONES

DESCRIPTION & BENEFITS

Drones or Unmanned Aerial Vehicles (UAVs) are aircrafts that are used in precision agriculture and specifically weed management to:

- **identify and map weed distribution** in fields allowing for timely treatments
- **precisely apply herbicides or bioherbicides** reducing the chemical input if combined with site-specific sprayings where noxious weeds are prevalent
- **monitor the crop and soil health** and assist decision-making on crop production and protection
- **collect data** on weed flora in remote areas reducing the time needed for on-site monitoring

STRENGTHS

- Precise application of herbicides and bioherbicides reducing the chemical input and minimizing environmental impact
- Advanced data collection on weed distribution and density through sensors and cameras to allow informed decision-making and site-specific weed management
- Ideal for quick surveys in large and remote areas compared to manual weed detection

OPPORTUNITIES

- Integration of drones into broader sustainable weed management planning allowing for their combination with other strategies (e.g., site-specific spraying, optimized mechanical weeding)
- Drone technology is becoming more affordable and accurate (e.g., improved sensors, longer battery life) which is increasingly accepted by farmers and leads to adoption
- Increased adoption by farmers could lead to less strict regulatory frameworks, promoting wider adoption (mainly by smallholders)

WEAKNESSES

- Adverse weather conditions such as strong winds and rain can limit the operational capacity of drones and lead to their underperformance
- The use of drones requires training, connection to cloud and other smart farming tools (often offered as a service by companies), certificates and licences, which could potentially lead to limited adoption by smallholder farmers
- Cost for the initial investment of purchasing and maintaining the drones, as well as multiple flights or recharging due to the short battery life

THREATS

- Data privacy and security concerns (e.g., transfer of sensitive personal data or business-farm information) could potentially cause conflicts in the use of drones
- Stringent restrictions and regulations may discourage farmers from investing into drones, affecting the wider adoption
- Data loss or malfunctions that could not be repaired/restored as developments in drone technology could potentially lead to technical support only for new models

TIPS

- **select an appropriate drone and sensors** for your field conditions and context, as not all drones and sensors/cameras are useful in all cropping systems. You should seek advice from experts and researchers to avoid unnecessary investment costs
- **be trained in the operation of drones or get ongoing support from experts** so that you constantly monitor the weed flora and crop health on your farm and be ready to adjust your decisions for weed management
- **use advanced data analytic tools and collaborate with researchers** to gain deeper knowledge about the dispersal-biology-ecology of weeds that will allow you to design more effective weed management treatments
- **validate drone-collected data** with field scouting to improve the reliability and accuracy of weed distribution maps
- **keep informed of local/regional/national regulations** on drone usage to avoid potential legal/ethical issues & keep all necessary licenses and certifications on file

LIABILITY DISCLAIMER

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