Deliverable 7.4: Practice Abstract – batch 1

Grant Agreement number: 101083589
Start date of the project: 01/05/2023 **End date of the project**: 30/04/2027
Deliverable due date: 30/04/2024 (initial) **Date of delivery**: 10/3/2025
Classification: Public

Associated Work Package(s)

WP1	WP2	WP3	WP4	WP5	WP6	WP7	WP8
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Version History

Version number	Implemented by	Notes
1.0	DELPHY	
1.1	UC & DELPHY	Revision based on the reviewers' report in the 1st RP

A series of 17 Practice Abstracts.

Number	Title
1	Tillage, chain mower and roller crimper impact on weed suppression
2	Use of pelargonic acid to control weeds in triticale crop
3	Arbuscular Mycorrhizal Fungi (AMF) inoculation of cover crop seeds
4	Unmanned Aerial Systems (UAS) for weed mapping
5	How to inoculate seeds with arbuscular mycorrhizal fungi
6	How to select the best performing cover crops to inoculate with mycorrhizae
7	Top weaknesses of herbicides for farmers, researchers and advisors
8	Top strengths of herbicides for farmers, researchers and advisors
9	Top weaknesses of non-chemical weed management for farmers, researchers and advisors
10	Top threats for non-chemical weed management for farmers, researchers and advisors
11	Top threats for agroecological weed management for farmers, researchers and advisors
12	Top weaknesses of agroecological weed management for farmers, researchers and advisors
13	Top opportunities of agroecological weed management for farmers, researchers and advisors
14	Top strengths of agroecological weed management for farmers, researchers and advisors
15	Most used weed management practices in annual crops
16	Most used weed management practices in perennial crops
17	Needs, barriers, gaps and opportunities for weed management in Europe

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Practice Abstract Nº 1

Tillage, chain mower and roller crimper impact on weed suppression

INTRODUCTION

Effective weed suppression is crucial in **organic cropping systems** to secure yields and reduce competition with main crops. This study assessed different cover crop termination methods—tillage, chain mowing, and roller cimper—on an organic cowpea trial site in Central Portugal. In this trial we compared the performance of a single cover crop (cc), a mixture of 3 cc and a mixture of 6 cc, before the sowing of cowpea.

PRACTICAL RECOMMENDATIONS

1. **Optimize cover crop sowing timing** to ensure optimal growth before termination and enhance weed suppression efficiency
2. **Consider integrating cover crop mixtures** to maximize ground coverage and weed suppression
3. **Adjust termination strategies** based on main crop requirements—roller crimper effectively suppresses weeds but may hinder crop emergence in certain conditions

MAIN RESULTS – OUTCOMES

- **Cover crop termination method strongly influenced weed suppression.** The roller crimper showed the highest weed control (>90%)
- **Delayed cover crop establishment affected growth and weed suppression.** Late sowing due to heavy rainfall slowed development, making termination less effective
- **Six-species cover crop mixture provided the best ground coverage**
- **Tillage improved cowpea growth but led to higher weed pressure.** In contrast, roller-crimped plots had excellent weed suppression but poor crop establishment
- **Cowpea struggled in non-tilled plots.** Thick mulch from shredded cover crops prevented germination, while extreme weather further hindered development

TILLAGE

CHAIN MOWER

ROLLER CRIMPER

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AGROECOLOGY FOR WEEDS

Practice Abstract Nº 2

Use of pelargonic acid to control weeds in triticale crop

INTRODUCTION

Weed control in triticale is challenging as a narrow row crop. **Pelargonic acid** (bioherbicide) is increasingly used as an alternative weed control method, both in organic systems as well as in conventional systems aiming to reduce reliance on herbicides. This study assessed the impact of pelargonic acid on weed suppression and triticale yield in trials in Sardinia, Italy.

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MAIN RESULTS – OUTCOMES

- Pelargonic acid effectively reduced weed biomass
- While **effective in weed control**, the application of pelargonic acid was associated with **lower triticale grain yield** compared to untreated and cover crop treatments
- Lower straw yield compared to cover crop treatments. The impact of pelargonic acid on overall biomass production suggests potential stress on the crop

PRACTICAL RECOMMENDATIONS

1. Optimize application timing and rate to minimize negative impacts on triticale yield while maximizing weed suppression

2. Combine pelargonic acid with other weed management strategies such as cover cropping or mechanical control to enhance effectiveness.

What is pelargonic acid?

Pelargonic acid (PA) ($CH_3(CH_2)_7CO_2H$, n-nonanoic acid) is a saturated, nine-carbon fatty acid (C9:0) naturally occurring as esters in the essential oil of *Pelargonium spp.* and can be derived from the tissues of various plant species. Pelargonic acid along with its salts and formulated with emulsifiers is used in terms of weed management as a **nonselective herbicide** suitable either for garden or professional uses worldwide.

Travlos, I., Rapti, E., Gazoulis, I., Kanatas, P., Tataridas, A., Kakabouki, I., & Papastylianou, P. (2020). The Herbicidal Potential of Different Pelargonic Acid Products and Essential Oils against Several Important Weed Species. Agronomy, 10(11), 1687. https://doi.org/10.3390/agronomy10111687

Learn more about bioherbicides on our GOOD website!
https://www.goodhorizon.eu/wp-content/uploads/2024/05/GOOD_11-bioherbicides-v2.pdf

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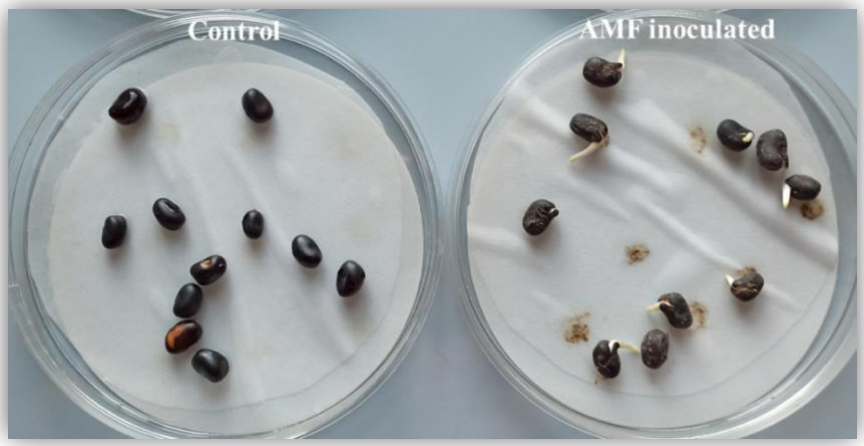
Practice Abstract Nº 3

Arbuscular Mycorrhizal Fungi (AMF) inoculation of cover crop seeds

INTRODUCTION

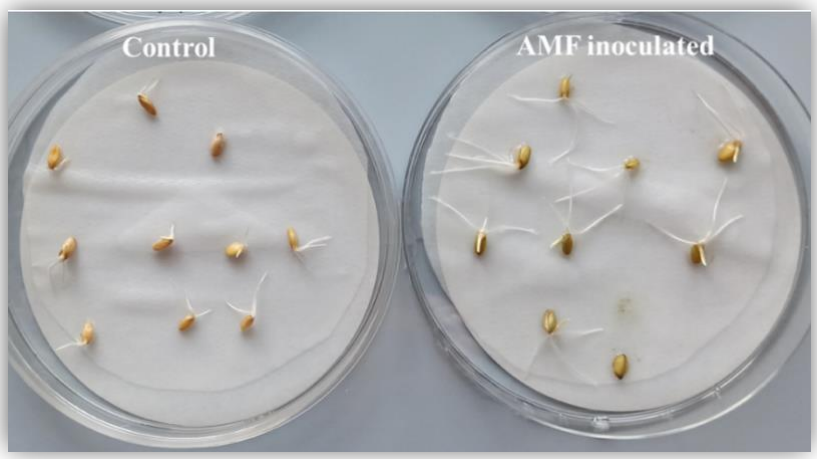
AMF are soil symbionts fulfilling a key function in the complex networks of belowground/aboveground biotic interactions as they live in association with the roots of most land plant families and influence not only soil fertility, but also plant nutrition, diversity and productivity, increasing plant resistance to biotic and abiotic stresses.



Copyrights: University of Pisa team
Non-inoculated (control) *Vicia faba minor* seeds vs AMF inoculated ones, two days after sowing

MAIN RESULTS – OUTCOMES

- The protocol utilized for seed inoculation did not affect seed germination. Five days after sowing, most seeds showed high germination percentages (80-100%), while species such as *Medicago truncatula* and *Phacelia sp*. showed low germination percentages (60%)
- The positive effect of seed inoculation was also observed on rootlets growth. Six species over eleven (*Pisum sativum*, *Triticum durum*, *Secale cereale*, *Vicia faba minor*, *Vicia villosa* and *Trifolium incarnatum*) showed significant longer rootlets in inoculated seeds compared with control (65%, 53%, 37%, 34%, 37%, 29%, 23% longer, respectively)



Copyrights: University of Pisa team
Non-inoculated (control) *Triticum durum* seeds vs AMF inoculated ones, two days after sowing

PRACTICAL RECOMMENDATIONS

1. AMF may reduce aggressive agricultural weeds growth, while enhancing the yield of agricultural crops & cover crops (cc)
2. AMF may favor cc rapid soil coverage and growth, smothering the weeds
3. Their use as inoculum represents one of the most promising tools for sustainable management of agricultural soils, being fundamental for organic food production, reducing agrochemicals and decreasing environmental damage

European Commission

You can read more in our open-access deliverable in Cordis
https://ec.europa.eu/research/participants/documents/downloadPublic?documentIds=080166e50bf65415&appId=PPGMS

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Practice Abstract Nº 4

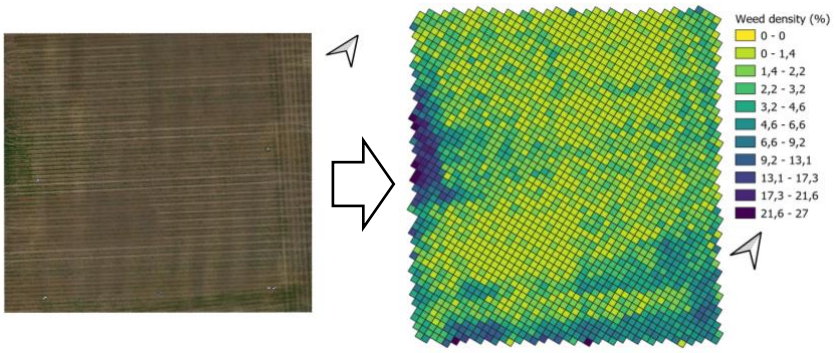
Unmanned Aerial Systems (UAS) for weed mapping

INTRODUCTION

Automated weed mapping can eventually be applied for site-specific weed management. Very high (mm) to high (cm) resolution RGB data are collected with UAS (unmanned aerial system) technology and are then analysed using deep learning technologies, either in a semi-automated (supervised) or automated (unsupervised) way. This results in weed density maps of either all weeds combined, of different genera of weeds, or of different species of weeds.

MAIN RESULTS – OUTCOMES

The main purpose of the digital maps is that they can eventually be used to automate weed management interventions. This is of course specific for each crop-weed species case, but based on the density maps and the acceptable weed pressure, the field can be divided into blocks, corresponding to the achievable minimal management unit, with each block being assigned the most suitable weed management (e.g., site-specific spraying)



If you want to learn more about weed mapping with drones, watch our videos!
https://youtu.be/kuOkQAnqcuM?feature=shared

PRACTICAL RECOMMENDATIONS

Design carefully the flight operations, select an appropriate UAS with efficient resolution, seek the advice/support of experts

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https://ec.europa.eu/research/participants/documents/downloadPublic?documentIds=080166e514015a12&appId=PPGMS

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Practice Abstract Nº 5

How to inoculate seeds with arbuscular mycorrhizal fungi

INTRODUCTION

Seed inoculation with AMF (Arbuscular Mycorrhizal Fungi) refers to the process of applying AMF spores or mycelium directly to seeds before sowing. This enhances the establishment of mycorrhizal fungi in the soil, promoting plant health, nutrient uptake, growth, and indirectly potentially weed suppression.

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Inoculated green seeds with different shape, size and coat (below), compared with non-inoculated ones (above) belonging to three different plant species.

MAIN RESULTS – OUTCOMES

We have achieved the following so far:

- List of native AMF taxa from 7 European countries with different edaphoclimatic conditions
- Production of native AMF inocula for seed coating in the relevant LLs
- Protocols and guidelines for successful seed inoculation of cover crops
- Preparation of the native AMF inocula for shipment to the relevant LLs, associating each inoculum with specific guidelines developed for the different cover crop species used in the different LLs across 7 European countries

You can read more in our open-access deliverable in Cordis https://ec.europa.eu/research/participants/documents/downloadPublic?documentIds=080166e50bf65415&appId=PPGMS

PRACTICAL RECOMMENDATIONS

You will need to have access to a good AMF inoculum and Liquid adhesive material (LAM). Certain AMF species may be more suitable for particular soil types or crops. Research or consult an agronomist/microbiologist to select the most appropriate species for your needs.
Seed inoculation should be performed utilizing the appropriate container, taking into account that the containers should be filled with the seeds up to 1/3, in order to shake seeds and the inoculation material, and reach an even coating. Allow dry seeds before sowing to avoid problems with the machine.

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AGROECOLOGY FOR WEEDS

Practice Abstract Nº 6
How to select the best performing cover crops to inoculate with mycorrhizae

INTRODUCTION

Arbuscular Mycorrhizal Fungi (AMF) form symbiotic relationships with plant roots, enhancing nutrient and water uptake, especially phosphorus, and increasing plant resistance to disease and drought. In GOOD project, we identify and multiply native AMF from the soils of our Living Labs, prepare an inoculum and coat the seeds of cover crops.

PRACTICAL RECOMMENDATIONS

No.	Steps
1	Get familiar with the **benefits** that mycorrhizal fungi bring
2	Prefer to use **native AMF** and cooperate with researchers/industry
3	**Select** carefully **the crops and cover crops** to inoculate with mycorrhizae (*avoid* allelopathic plants) - Legumes fix nitrogen and are good AMF hosts (*avoid lupin as a non-host*) - Grasses (e.g., oat, rye) and other broadleaf species (e.g., flax) are among the best options for AMF inoculation - Brassica species (e.g., mustard) are not AMF host
4	Monitor and take into account local **climate and soil conditions** to ensure proper colonization
5	Choose mixtures of species and apply diversification practices (e.g., intercropping, relay and strip cropping)
6	Balance the benefits and ecosystem services that the cover crops bring to the field. You will have to prioritize what is more necessary: biomass, weed suppression, nitrogen fixation, soil health etc.

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Practice Abstract Nº 7

Top weaknesses of herbicides for farmers, researchers and advisors

INTRODUCTION

The effectiveness and sustainability of weed management strategies depend on stakeholders' perspectives, including farmers, researchers, and advisors. Understanding their concerns regarding **herbicides' weaknesses** is crucial for developing integrated and sustainable weed management approaches. This study identifies commonalities and differences, enabling better-targeted solutions for agroecological weed management.

The analysis is based on 240 interviews conducted at the GOOD Living Labs in 2023 and presented as aggregated data.

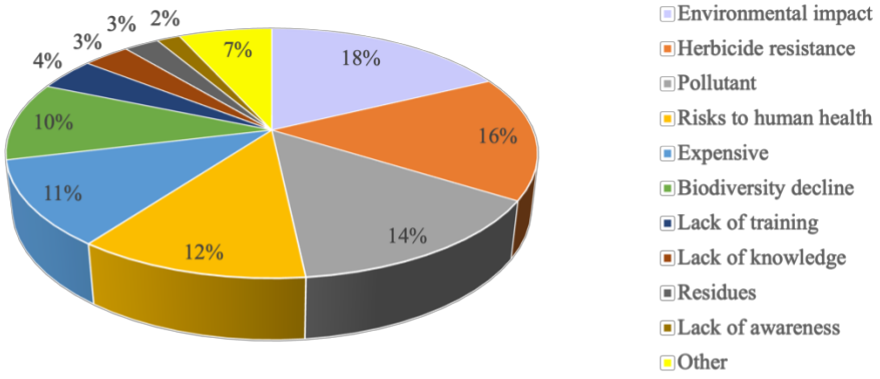
MAIN RESULTS – OUTCOMES

- Across all groups, environmental impact is a top concern, highlighting the need for sustainable alternatives
- All recognize the increasing challenge of herbicide-resistant weeds
- Herbicides are perceived as expensive, particularly by farmers, influencing their weed management decisions
- Compared to other groups, advisors emphasize the negative effects of herbicides on biodiversity

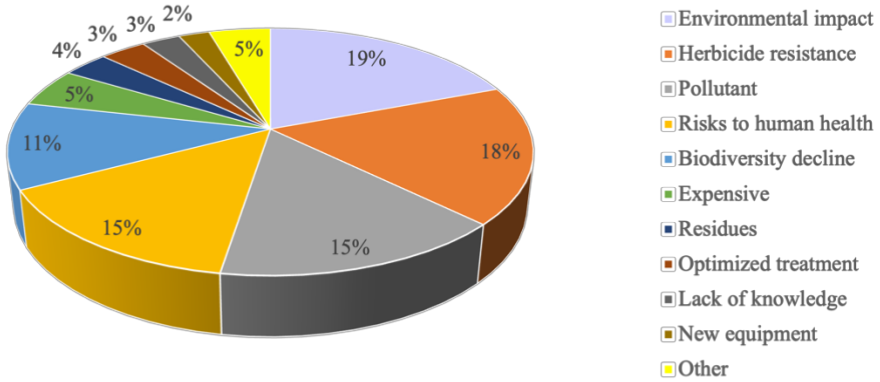
PRACTICAL RECOMMENDATIONS

1. **Promote agroecological weed management** such as cover crops and bioherbicides to reduce herbicide reliance
2. **Create farmer training programs** to improve knowledge and implementation of agroecological weed management strategies
3. Encourage **research and innovation** & support **policies** for sustainable weed management

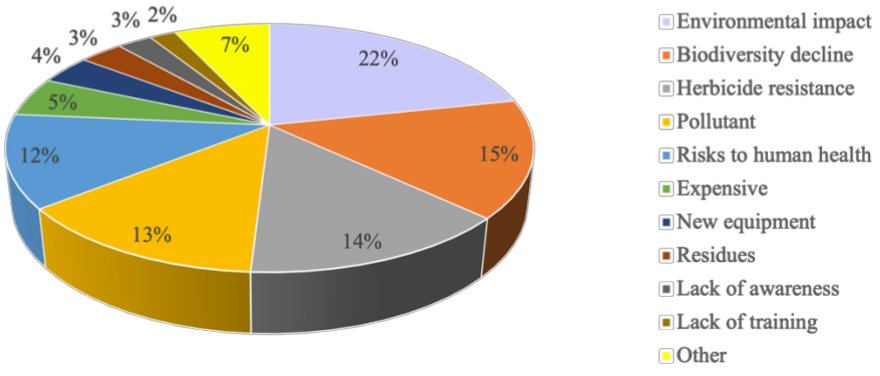
TOP 10 WEAKNESSES OF HERBICIDES FOR FARMERS



TOP 10 WEAKNESSES OF HERBICIDES FOR RESEARCHERS



TOP 10 WEAKNESSES OF HERBICIDES FOR ADVISORS



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Practice Abstract Nº 8

Top strengths of herbicides for farmers, researchers and advisors

INTRODUCTION

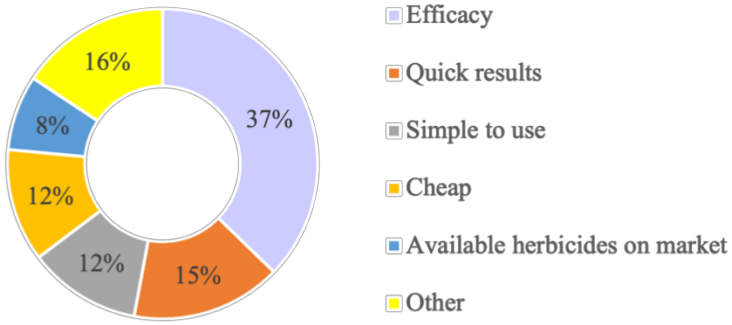
The effectiveness and sustainability of weed management strategies depend on stakeholders' perspectives, including farmers, researchers, and advisors. Understanding their concerns regarding **herbicides' strengths** is crucial for developing integrated and sustainable weed management approaches. This study identifies commonalities and differences, enabling better-targeted solutions for agroecological weed management.

The analysis is based on 240 interviews conducted at the GOOD Living Labs in 2023 and presented as aggregated data.

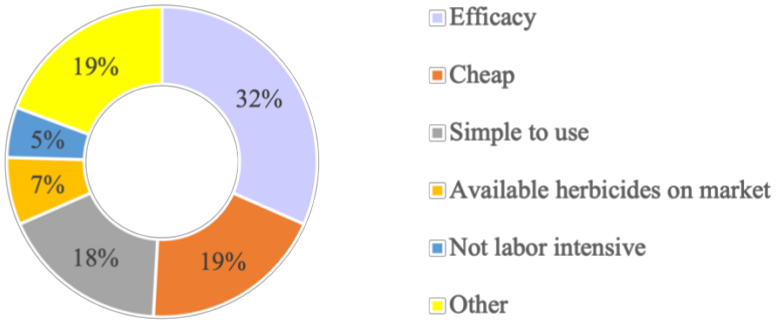
MAIN RESULTS – OUTCOMES

- Across all groups, herbicides' ability to control weeds effectively is their most recognized strength
- Farmers and advisors appreciate herbicides for their rapid action, which ensures timely weed suppression
- Simple application methods make herbicides appealing, particularly to farmers and advisors
- Researchers and advisors acknowledge herbicides' affordability and economic benefits in weed management

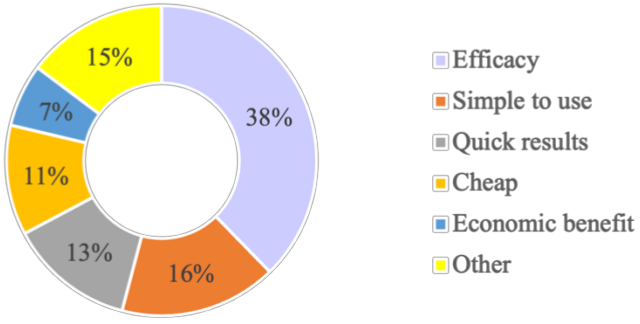
TOP 5 STRENGTHS OF HERBICIDES (FARMERS)



TOP 5 STRENGTHS OF HERBICIDES (RESEARCHERS)



TOP 5 STRENGTHS OF HERBICIDES (ADVISORS)



PRACTICAL RECOMMENDATIONS

1. **Promote agroecological weed management** such as cover crops and bioherbicides to reduce herbicide reliance
2. **Create farmer training programs** to improve knowledge and implementation of agroecological weed management strategies
3. Encourage **research and innovation** & support **policies** for sustainable weed management

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AGROECOLOGY FOR WEEDS

Practice Abstract Nº 9

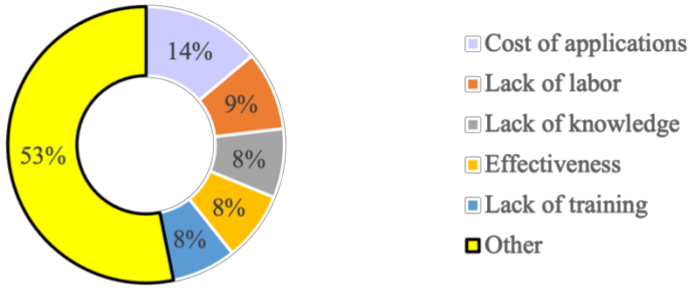
Top weaknesses of non-chemical weed management for farmers, researchers and advisors

INTRODUCTION

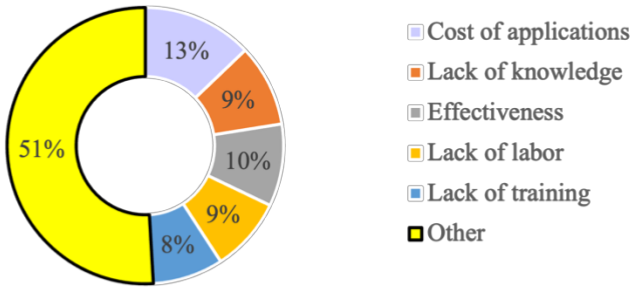
The effectiveness and sustainability of weed management strategies depend on stakeholders' perspectives, including farmers, researchers, and advisors. Understanding their concerns regarding **non-chemical weed management (NCWM) weaknesses** is crucial for developing integrated and sustainable weed management approaches. This study identifies commonalities and differences, enabling better-targeted solutions for agroecological weed management.

The analysis is based on 240 interviews conducted at the GOOD Living Labs in 2023 and presented as aggregated data.

TOP 5 WEAKNESSES OF NON-CHEMICAL WEED MANAGEMENT (FARMERS)



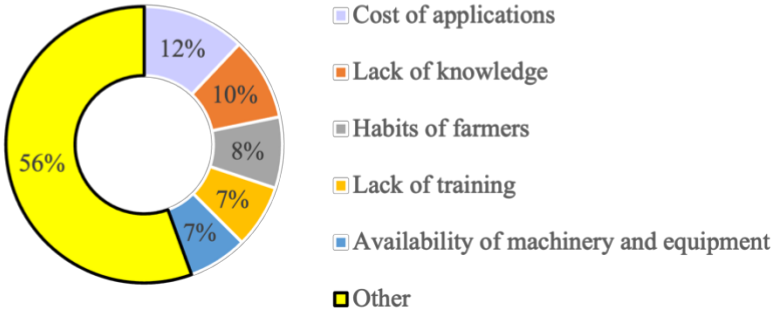
TOP 5 WEAKNESSES OF NON-CHEMICAL WEED MANAGEMENT (RESEARCHERS)



MAIN RESULTS – OUTCOMES

- Farmers, researchers, and advisors all highlight the expense associated with NCWM methods, limiting their adoption
- Non-chemical methods often require more labor, posing a challenge in agricultural systems facing workforce shortages
- A lack of knowledge and training on NCWM techniques hinders effective implementation, especially among farmers and advisors
- Factors such as the availability of equipment, entrenched farming habits, and other difficulties further complicate the transition to NCWM

TOP 5 WEAKNESSES OF NON-CHEMICAL WEED MANAGEMENT (ADVISORS)



PRACTICAL RECOMMENDATIONS

1. **Promote agroecological weed management** such as cover crops and bioherbicides to reduce herbicide reliance
2. **Create farmer training programs** to improve knowledge and implementation of agroecological weed management strategies
3. Encourage **research and innovation** & support **policies** for sustainable weed management

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AGROECOLOGY FOR WEEDS

Practice Abstract Nº 10

Top threats for non-chemical weed management for farmers, researchers and advisors

INTRODUCTION

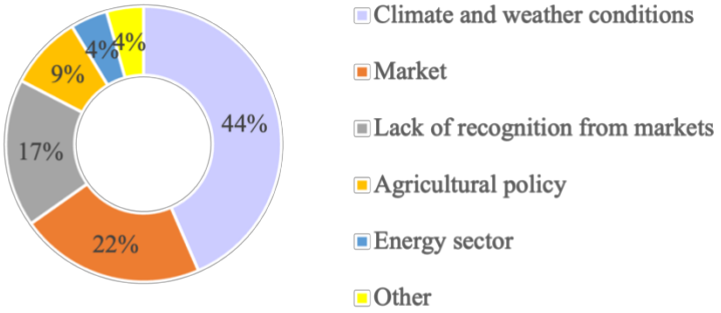
The effectiveness and sustainability of weed management strategies depend on stakeholders' perspectives, including farmers, researchers, and advisors. Understanding their concerns regarding **non-chemical weed management (NCWM) threats** is crucial for developing integrated and sustainable weed management approaches. This study identifies commonalities and differences, enabling better-targeted solutions for agroecological weed management.

The analysis is based on 240 interviews conducted at the GOOD Living Labs in 2023 and presented as aggregated data.

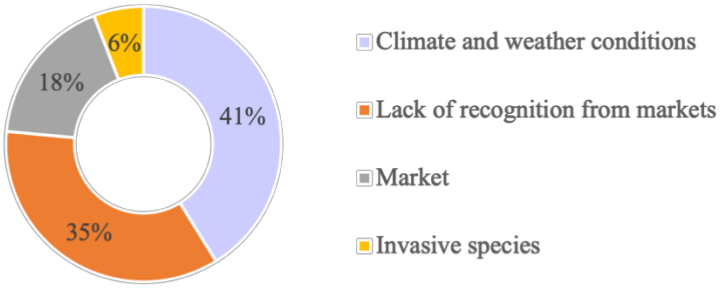
MAIN RESULTS – OUTCOMES

- Across all stakeholder groups, changing climate patterns and unpredictable weather conditions are seen as major obstacles to NCWM implementation
- Farmers and advisors emphasize that market dynamics, including competition and pricing, make NCWM less economically viable
- Researchers, advisors, and farmers note that non-chemical approaches often do not receive adequate recognition or financial incentives in the marketplace
- Farmers highlight the role of agricultural policies in shaping weed management choices, while advisors see the energy sector as a competing factor affecting land use and resources
- Researchers stress the growing challenge of invasive weeds

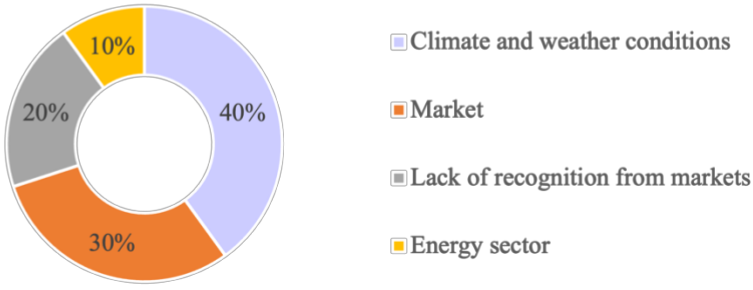
TOP 5 **THREATS FOR NON-CHEMICAL WEED MANAGEMENT (FARMERS)**



TOP 5 **THREATS FOR NON-CHEMICAL WEED MANAGEMENT (RESEARCHERS)**



TOP 5 **THREATS FOR NON-CHEMICAL WEED MANAGEMENT (ADVISORS)**



PRACTICAL RECOMMENDATIONS

1. **Promote agroecological weed management** such as cover crops and bioherbicides to reduce herbicide reliance
2. **Create farmer training programs** to improve knowledge and implementation of agroecological weed management strategies
3. Encourage **research and innovation** & support **policies** for sustainable weed management

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AGROECOLOGY FOR WEEDS

Practice Abstract Nº 11

Top threats for agroecological weed management for farmers, researchers and advisors

INTRODUCTION

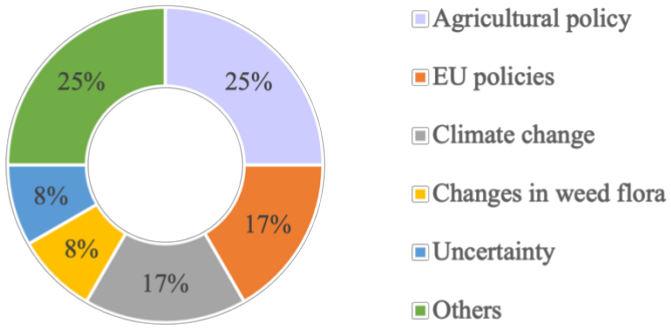
The effectiveness and sustainability of weed management strategies depend on stakeholders' perspectives, including farmers, researchers, and advisors. Understanding their concerns regarding **agroecological weed management (AWM) threats** is crucial for developing integrated and sustainable weed management approaches. This study identifies commonalities and differences, enabling better-targeted solutions for agroecological weed management.

The analysis is based on 240 interviews conducted at the GOOD Living Labs in 2023 and presented as aggregated data.

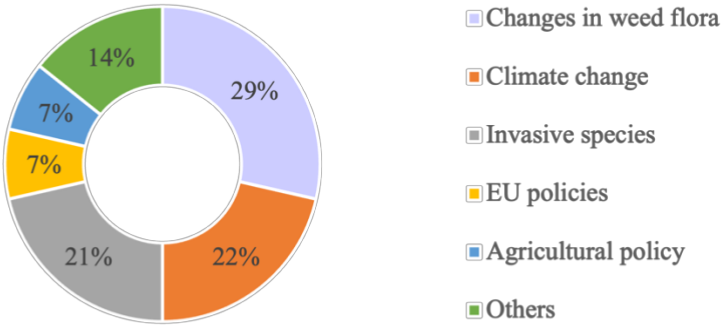
MAIN RESULTS – OUTCOMES

- Researchers (29%) and advisors (43%) identify shifts in weed populations as a major threat, highlighting the need for adaptive management approaches
- All groups recognize climate change as a significant challenge, influencing weed dynamics and management practices
- Farmers and researchers emphasize that evolving regulatory frameworks impact decision-making in weed management
- Researchers and advisors stress the growing challenge of invasive weed species in agroecosystems

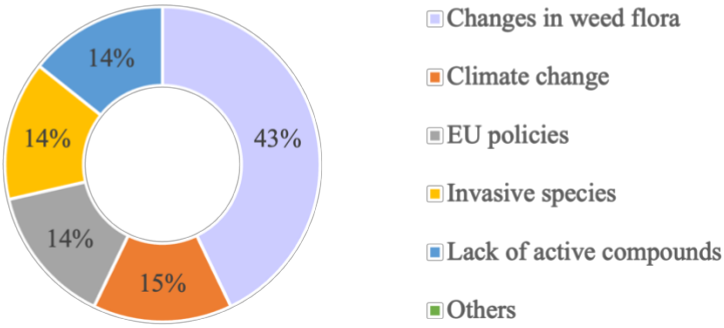
TOP 5 **THREATS FOR AWM** FOR **FARMERS**



TOP 5 **THREATS FOR AWM** FOR **RESEARCHERS**



TOP 5 **THREATS FOR AWM** FOR **ADVISORS**



PRACTICAL RECOMMENDATIONS

1. **Promote agroecological weed management** such as cover crops and bioherbicides to reduce herbicide reliance
2. **Create farmer training programs** to improve knowledge and implementation of agroecological weed management strategies
3. Encourage **research and innovation** & support **policies** for sustainable weed management

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Practice Abstract Nº 12

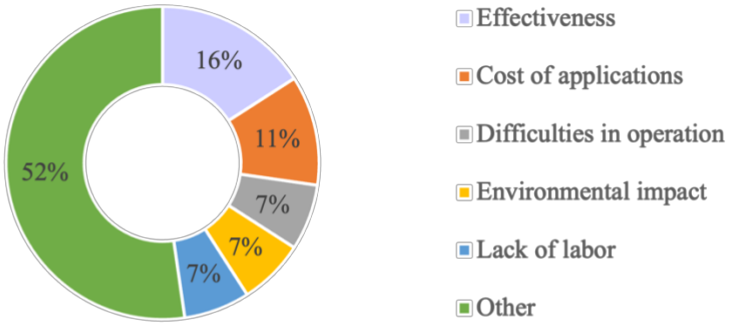
Top weaknesses of agroecological weed management for farmers, researchers and advisors

INTRODUCTION

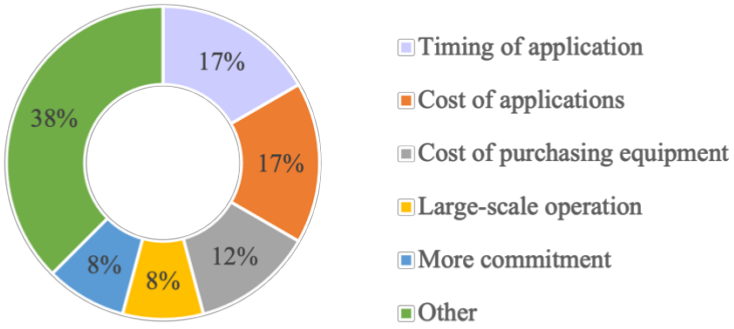
The effectiveness and sustainability of weed management strategies depend on stakeholders' perspectives, including farmers, researchers, and advisors. Understanding their concerns regarding **agroecological weed management (AWM) weaknesses** is crucial for developing integrated and sustainable weed management approaches. This study identifies commonalities and differences, enabling better-targeted solutions for agroecological weed management.

The analysis is based on 240 interviews conducted at the GOOD Living Labs in 2023 and presented as aggregated data.

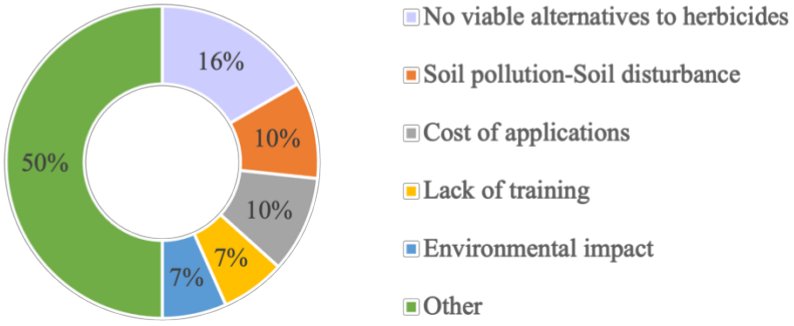
TOP 5 WEAKNESSES OF AWM FOR FARMERS



TOP 5 WEAKNESSES OF AWM FOR RESEARCHERS



TOP 5 WEAKNESSES OF AWM FOR ADVISORS



MAIN RESULTS – OUTCOMES

- All groups cite the cost of application as a key limitation, making AWM less accessible
- Researchers stress timing as a major weakness, alongside difficulties in applying AWM to large-scale operations
- Advisors highlight the lack of viable alternatives to herbicides, while farmers question AWM's overall effectiveness

PRACTICAL RECOMMENDATIONS

1. **Promote agroecological weed management** such as cover crops and bioherbicides to reduce herbicide reliance
2. **Create farmer training programs** to improve knowledge and implementation of agroecological weed management strategies
3. Encourage **research and innovation** & support **policies** for sustainable weed management

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Practice Abstract Nº 13

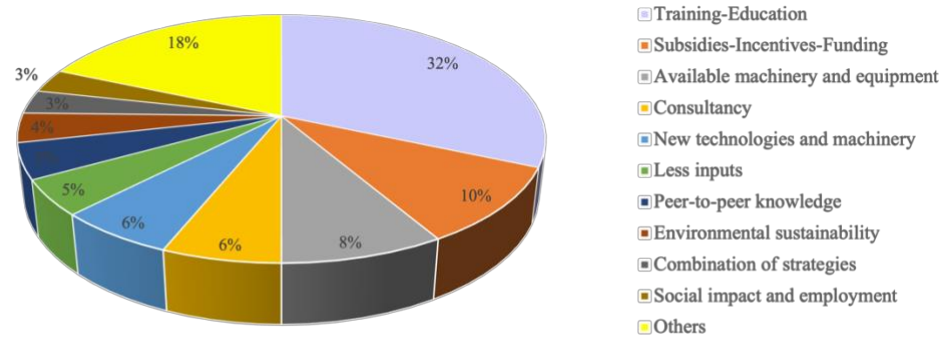
Top opportunities for agroecological weed management for farmers, researchers and advisors

INTRODUCTION

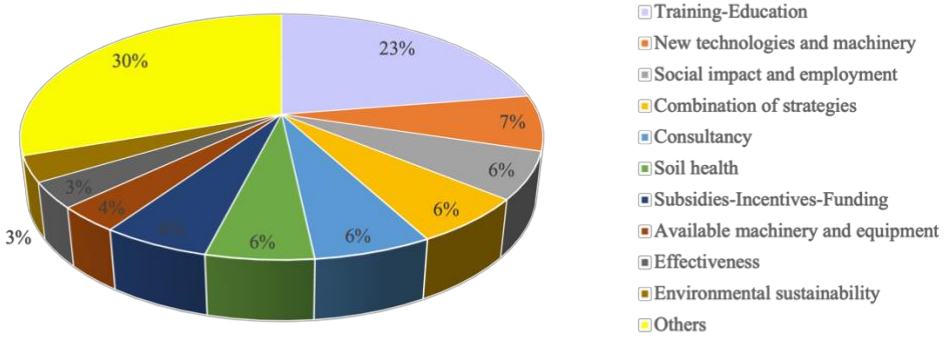
The effectiveness and sustainability of weed management strategies depend on stakeholders' perspectives, including farmers, researchers, and advisors. Understanding their opinions regarding **agroecological weed management (AWM) opportunities** is crucial for developing integrated and sustainable weed management approaches. This study identifies commonalities and differences, enabling better-targeted solutions for agroecological weed management.

The analysis is based on 240 interviews conducted at the GOOD Living Labs in 2023 and presented as aggregated data.

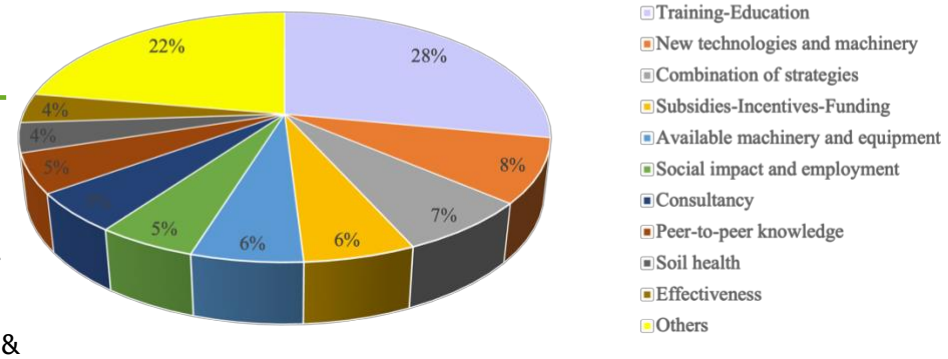
TOP 10 **OPPORTUNITIES FOR AWM** FOR **FARMERS**



TOP 10 **OPPORTUNITIES FOR AWM** FOR **RESEARCHERS**



TOP 10 **OPPORTUNITIES FOR AWM** FOR **ADVISORS**



MAIN RESULTS – OUTCOMES

- Training and education are considered a major opportunity for AWM by all groups
- Researchers and advisors highlight the opportunity for the use of new technologies and machinery, while farmers claim that there is available machinery
- Researchers focus on the social impact and employment that AWM could bring
- Farmers and advisors see opportunities in subsidies-incentives and funding

PRACTICAL RECOMMENDATIONS

1. **Promote agroecological weed management** such as cover crops and bioherbicides to reduce herbicide reliance
2. **Create farmer training programs** to improve knowledge and implementation of agroecological weed management strategies
3. Encourage **research and innovation** & support **policies** for sustainable weed management

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AGROECOLOGY FOR WEEDS

Practice Abstract Nº 14

Top strengths of agroecological weed management for farmers, researchers and advisors

INTRODUCTION

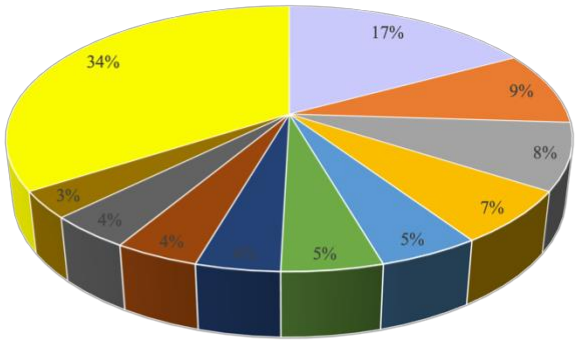
The effectiveness and sustainability of weed management strategies depend on stakeholders' perspectives, including farmers, researchers, and advisors. Understanding their opinions regarding **agroecological weed management (AWM) strengths** is crucial for developing integrated and sustainable weed management approaches. This study identifies commonalities and differences, enabling better-targeted solutions for agroecological weed management.

The analysis is based on 240 interviews conducted at the GOOD Living Labs in 2023 and presented as aggregated data.

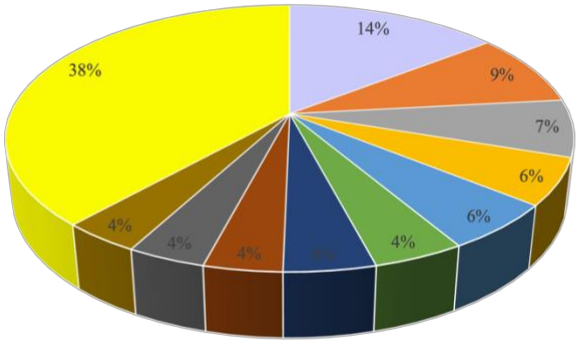
MAIN RESULTS – OUTCOMES

- The improvement in soil health is characterized as a major strength of AWM by all groups
- Effectiveness (of specific practices and in certain cropping systems) is also considered an AWM strength by all groups
- All groups believe that AWM can contribute to better management of water resources
- Farmers and researchers think that the combination of different strategies is a strength

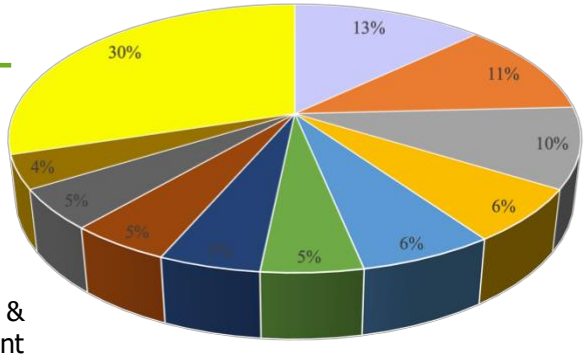
TOP 10 **STRENGTHS OF AWM** FOR **FARMERS**



TOP 10 **STRENGTHS OF AWM** FOR **RESEARCHERS**



TOP 10 **STRENGTHS OF AWM** FOR **ADVISORS**



PRACTICAL RECOMMENDATIONS

1. **Promote agroecological weed management** such as cover crops and bioherbicides to reduce herbicide reliance
2. **Create farmer training programs** to improve knowledge and implementation of agroecological weed management strategies
3. Encourage **research and innovation** & support **policies** for sustainable weed management

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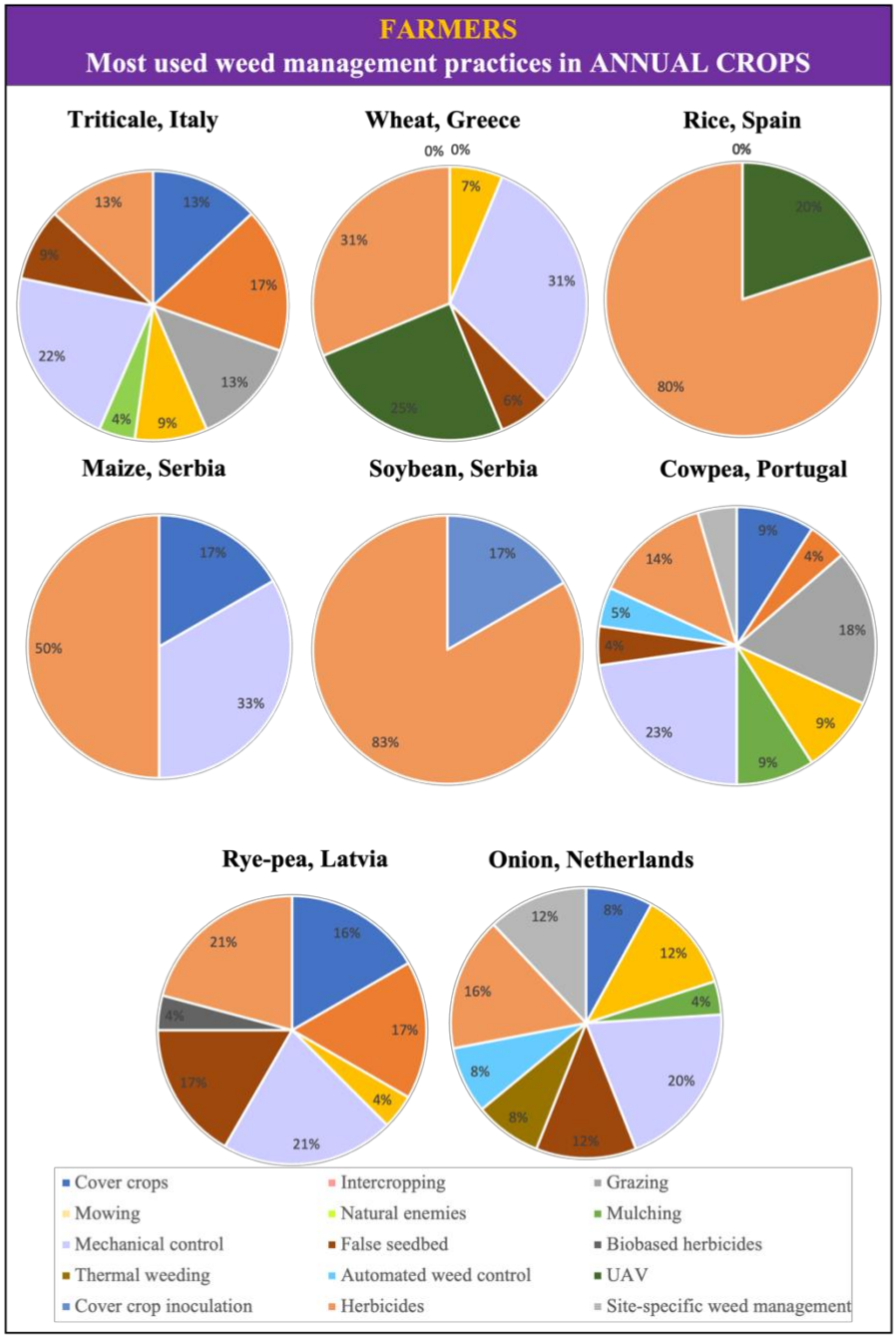
AGROECOLOGY FOR WEEDS

Practice Abstract Nº 15

Most used weed management practices in annual crops

INTRODUCTION

Effective weed management in **annual cropping systems** is crucial for maintaining productivity and reducing chemical inputs. Through data collection across Living Labs, we analyzed the most commonly used weed management strategies by farmers. This analysis aimed to identify existing practices to explore the potential of agroecological approaches while reducing dependency on herbicides.



MAIN RESULTS – OUTCOMES

- Farmers rely heavily on herbicides
- Mechanical control is the second most used practice to manage weeds
- Natural, biological and technological practices are less used

PRACTICAL RECOMMENDATIONS

Combine different weed management practices to gradually reduce reliance on herbicides

Experiment with cover crops and other crop diversification practices to reduce weed pressure and seek technical advice on choosing the best species and determining the timing of applications

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Practice Abstract Nº 16

Most used weed management practices in perennial crops

INTRODUCTION

Understanding the most commonly used weed management strategies in **perennial crops** is essential for improving sustainability and efficiency in agricultural systems. Through and data collection across Living Labs, we analyzed the most frequently implemented weed control practices by farmers. This information helps identify trends, gaps, and opportunities to enhance agroecological weed management while reducing herbicide dependency.

MAIN RESULTS – OUTCOMES

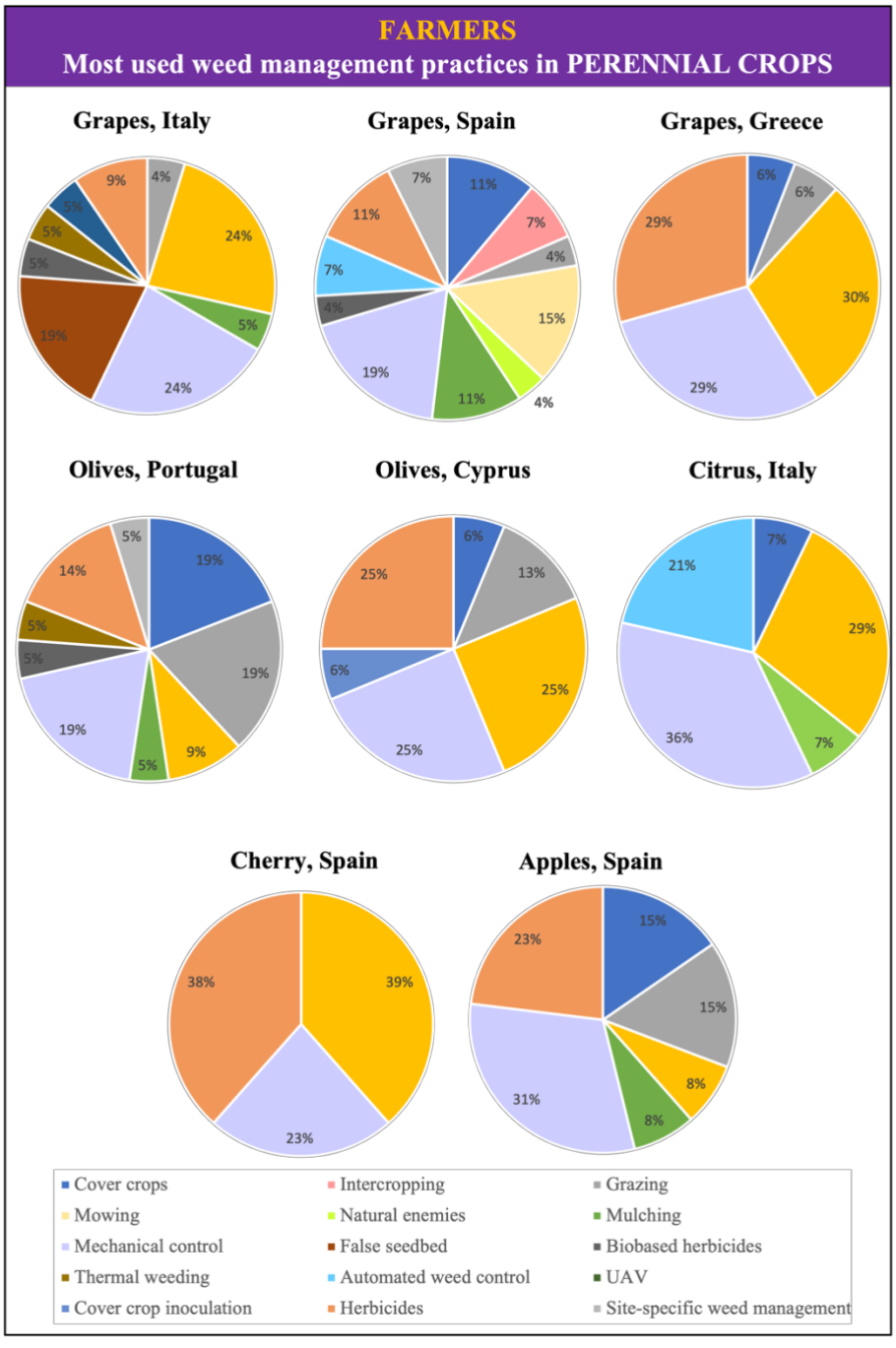
- Farmers adopt diverse strategies
- The use of cover crops increases
- Mowing & mechanical control are widely used
- The use of herbicides remains significant
- There are different dynamics & capacity for AWM from Living Lab to another

PRACTICAL RECOMMENDATIONS

Combination of practices to reduce herbicide reliance

Promote crop diversification to reduce the weed pressure (crop rotation, cover crops, intercropping)

Test new technologies and engage in field trials to gain hands-on experience



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AGROECOLOGY FOR WEEDS

Practice Abstract Nº 17

Needs, barriers, gaps and opportunities for weed management in Europe

INTRODUCTION

To better understand the challenges and opportunities in agroecological weed management (AWM), we conducted interviews and questionnaires across multiple Living Labs with stakeholders, including farmers, researchers, advisors, policymakers, consumers and industry representatives. This analysis aimed to identify key needs, existing barriers, knowledge gaps, and opportunities for advancing sustainable weed management practices based on agroecological principles.

MAIN RESULTS – OUTCOMES

The results are aggregated across the Living Labs to show the key needs, barriers, gaps and opportunities for agroecological weed management in Europe.

Key findings

NEEDS

- Training & education
- Technical solutions
- New policies
- Extension services
- Funding & labor

OPPORTUNITIES

- New business models
- Implementation of IPM
- Ecosystem services
- Peer-to-peer knowledge
- Reduction of reliance on herbicides

BARRIERS

- Regulatory challenges
- Climate change
- Changes in weed flora & invasive species
- Lack of funding & low consumer awareness
- Complexity & time consuming

GAPS

- Lack of knowledge & practical experience
- Lack of labor
- Lack of incentives-subsidies
- Cost of applications-machinery
- Changes in farmers' habits

PRACTICAL RECOMMENDATIONS

1. Enhance farmer training & knowledge sharing through (1) peer-to-peer exchange of knowledge, (2) demonstration events showcasing successful AWM strategies, (3) hands-on programs
2. Foster innovation & research on AWM through the (1) active involvement of farmers into the research part, (2) monitoring of sustainability dimensions, (3) exploration of combinations of practices, (4) new business models
3. Advocate for economic incentives & policy support to boost market acceptance and make resilient systems
4. Participate in Living Labs and other collaboration networks to co-create solutions that are tailor-made to your region and farming system

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