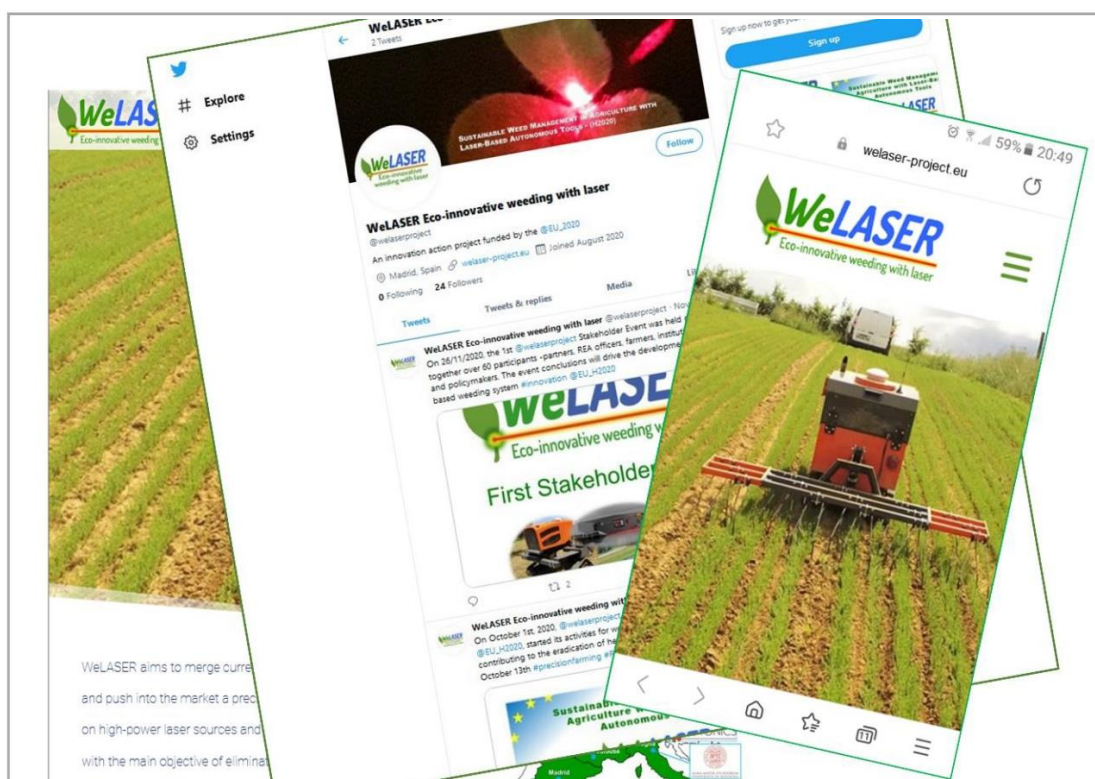




Sustainable Weed Management in Agriculture with Laser-Based Autonomous Tools

D6.2 - Communication, dissemination and exploitation activities and results (I)



Funded by the Horizon 2020 programme of the European Union

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Disclaimer

The views and opinions expressed in this document are solely those of the project, not the European Commission.

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EXECUTIVE SUMMARY

This deliverable provides a broad overview of the communication, dissemination and exploitation activities implemented within the WeLASER project in the first 12 months of the project, and provides information about the dissemination and exploitation activities planned for the rest of the project.

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LIST OF ACRONYMS AND ABBREVIATIONS

AGC:	Agreenculture
CATI	Computer Assisted Telephone Interviewing
COAG:	Coordinator of Farmer Organizations and Livestock Rural Initiative of Spain
CSIC:	Spanish National Research Council
DoA:	Description of the Action (A part of the Grant Agreement)
FUT:	Futonics
IETU:	Institute for Ecology of Industrial Areas
IoT	Internet of Things
KPI	Key Performance Indicators
LZH:	Laser Zentrum Hannover
M1 – M36:	Month within the period of project development
PESTEL	Political (P), Economic (E), Social (S), Technological (T), Environmental (E), and Legal (L).
UCPH:	University of Copenhagen
UGENT:	Ghent University
UNIBO:	University of Bologna
VDBP:	Van den Borne Projecten
WP:	Work Package

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1. PURPOSE OF THE DOCUMENT

The objective of this annual report on the communication, dissemination and exploitation activities is to provide a thorough overview of the executed activities for the first year of the project. This overview is a valuable tool and gives a detailed insight in this kind of actions made around the project. Furthermore, the project's plans on communication, dissemination, and exploitation activities for the remainder of the project are outlined.

This deliverable will be updated in M24 and 36 to produce D6.3 and 6.4, respectively.

2. INTRODUCTION

2.1. About WeLASER

WeLASER aims to merge current technologies to build, assess and push into the market a precision weeding system based on high-power laser sources and autonomous mobile systems with the main objective of eliminating the use of herbicides while improving productivity and competitiveness; such a system would eradicate health risks and environmental adverse effects associated with the use of herbicides.

In a context of a world growing population and higher needs of reducing the uses of pesticides and fertilizers, WeLASER seeks for a more sustainable management. Mechanical solutions contribute to deteriorate the soil properties, harm beneficial soil organisms and provide poor results for in-row weeding. However, the WeLASER solution focuses on non-chemical weed management based on applying lethal doses of energy on the weed meristems using a high-power laser source. An AI-vision system discriminates crops from weeds and detects the position of the weed meristems to point the laser on them using a laser scanner. An autonomous vehicle carries these systems all over the field. A smart controller coordinates these systems and uses IoT and cloud computing techniques to manage agricultural knowledge. This technology will provide a clean solution to the weeding problem and will help to decrease significantly the chemicals on the environment.

2.2. About WP6 on Knowledge spread

Regarding knowledge spread, WeLASER WP6 main objective is to create visibility to the consortium by planning a fruitful communication and dissemination strategy to promote the project results. To this aim involvement of all actors in the diffusion of knowledge is structured through the multiactor strategy. Communication actions provide targeted information to multiple audiences according to the strategies defined. Dissemination activities diffuse the technological and scientific advances of WeLASER to the research community.

To maximise the project impact, a continuously updated exploitation plan specifies the management of the full-exploitation chain activities focusing on the market analysis and market strategy, distribution and pricing models. Commercialization, exploitation, and market deployment plan

beyond the duration of the project is also addressed.

3. WeLASER STAKEHOLDERS AND AUDIENCE

Stakeholders are an essential point to consider when defining the WeLASER dissemination and communication plans as they are a key target from the outset of the project not only to spread the WeLASER activities, but also to promote the uptake of WeLASER project results. Also, according to the multi-actor involvement strategy, all stakeholders will monitor and contribute to the activities related to communication, dissemination and exploitation.

As part of the multi-actor involvement strategy, a first identification of stakeholders was carried out until mid-November 2020 and continues along the duration of the project. Stakeholders were identified, balance-selected and engage from four different groups, which are in line with the categories covered by the dissemination and communication plan:

❖ Academic and research

- Scientific and education community: universities, high education and research institutes;
- Education and training institutions, educational institutions and schools;
- National and international research centres;
- Students community: to engage the student community in their different levels (undergraduate, graduate, M.Sc. and Ph.D.) are of paramount importance for training new professionals and covering the new expected jobs.
- Standardization institutions: institutions for standardization through their tools and committees to develop new standards. For instance, International Organization for Standardization (ISO), the International Electro-technical Commission (IEC), CENELEC - Comité Européen de Normalisation Electrotechnique and collaboration, CEN National Standardization Bodies/CENELEC National Committees and the national trade associations representing different sectors of business and industry.

❖ Businesses

- Industrial community: machinery associations at national and European level. Machinery firms, robotics companies, laser industry. Farming machinery related industry.
- End users: farmers and farmer associations at national, European and international level, crop protection associations, organic farming associations, cooperative and cooperatives associations.
- Investors: individual and institutional investors, agricultural and investment groups, banks, investment funds, crowdfunding tools and institutions.

❖ Decision-makers and Policy-makers

- Local, regional, national governments and EU policy-makers, government funding bodies



and agencies.

- Policy influencers: advocacy groups and associations pertinent as influencers and thought leaders in their communities and sectors.
- European Innovation Partnership for Agricultural productivity and sustainability (EIP-AGRI).
- European Commission and Research Executive Agency.

❖ **General public**

- Society at large: civil society and general stakeholders
- General media.
- Professional and specialized media.

4. CONTENT FOR COMMUNICATION AND DISSEMINATION

All WeLASER templates and supporting material for communication and dissemination was created and agreed between M1 and M2 of the project.

4.1. Logos

The WeLASER logos were created and agreed in M1 of the project and all specifications around design, colour and presentation were detailed. Every communication involving graphic content (i.e. printed media, online website and social media channels, emails, newsletters, presentations, publications etc.) on all WeLASER channels to external audiences has to include the WeLASER logo in an appropriate format.



Fig. 4.1 WeLASER logo with slogan



Fig. 4.2 WeLASER logo without slogan



Fig. 4.3 WeLASER logos adapted for social media



Fig. 4.4 WeLASER logos adapted to other formats

As established in the Grant Agreement, all dissemination of results display the EU emblem and include the text: *“This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 101000256”*.

4.2. Templates

The WeLASER templates were defined and agreed in M1 of the project. Specifically, templates for the following types of documents were created:

- POWER POINT format template for presentations.
- WORD format template for deliverables.
- WORD format template for newsletters.
- WORD format template for the agendas and minutes of the meetings.

WeLASER templates are gathered in Annex 1.

4.3. Roll-up

The WeLASER roll-up design were defined and agreed in M2 of the project. This design provides WeLASER consortium a common and high-impact resource for fairs, congress, field days and other dissemination events. Posters presented in section 5.1.11 are based on this roll-up design.





Fig. 4.5 WeLASER roll-up

4.4. Virtual background

The WeLASER virtual background design were defined and agreed in M2 of the project. This resource is used in on-line events and virtual meetings, allowing a common and useful format, especially in the context of COVID-19 restrictions.



Fig. 4.6 WeLASER virtual background

5. DISSEMINATION AND COMMUNICATION ACTIVITIES

Dissemination activities in WeLASER are devoted to diffuse technological and scientific advances of WeLASER to the industrial community and academia. In particular, the dissemination purposes are devoted to raise awareness and to increase understanding of what is doing, to inform of the advances of the project, to engage and getting input from that audience, and to promote and encourage acceptance and recognition to ease the way for market deployment of the project results and outputs.

The actions are focused on peer-reviewed scientific publications through gold and green open access approaches, where the participants from academia are committed to contribute with publications in scientific conferences and journals indexed in the Journal Citation Report (JCR), at national and international level.

Dissemination started in M6, when the first results appear, and will continue until the end of the project development.

Communication activities in WeLASER are devoted to generating the proper messages regarding the project activities and the project results to be scattered through the media to reach the general audience, professionals and the local, national and EU governments with the aim of improving awareness and trust in new weeding technology.

The activities are focused on the launch and maintenance of the project website, the creation and management of social media accounts. D6.1 reported about the creation of this communication material. Another important part of this activity is devoted to the elaboration and issue of the “Practice Abstracts” of the Agricultural European Innovation Partnership (EIP-AGRI) common format to be made available to the interested communities through the on-line EIP-AGRI database.

Communication started in M1 and will continue to M36.

5.1. Activities planned and developed

5.1.1. Journal articles

WeLASER members coming from the academia submit manuscripts to journals indexed in the Journal Citation Report (JCR) to inform the scientific community about the project outcomes, as scientists from universities and research centres traditionally look for new interesting results in peer-reviewed scientific journals. Achieving publication in this type of journals will also be a measure of the quality of the project results.

During the first year of WeLASER project several articles were published (Table 5.1).



Table 5.1 WeLASER journal articles

	Type	DOI	ISSN or eISSN	Title of the journal	Number, date	Publisher	Place of publication	Year of publication	Relevant pages	Public & private publication ¹	Peer- review	Open access
Title	A Concept of a Compact and Inexpensive Device for Controlling Weeds with Laser Beams											
Authors	Ildar Rakhmatulin, Christian Andreasen											
	Article in journal	10.3390/agronomy10101616	20734395	Agronomy	10/10	MDPI	Switzerland	2020	1616	YES	YES	Gold OA 1,482.0 €
Title	Crop Management with the IoT: An Interdisciplinary Survey											
Authors	Giuliano Vitali, Matteo Francia, Matteo Golfarelli, Maurizio Canavari											
	Article in journal	10.3390/agronomy11010181	20734395	Agronomy	11/1	MDPI	Switzerland	2021	181	YES	YES	Gold OA -- €

¹ Both the joint publications coming from academic and corporate project participants as well as joint publications of project participants with academic/corporate organisations outside the consortium (as long as they are related to the funded project) should be reported

5.1.2. International conference papers and presentations

The WeLASER partners attend relevant conferences to inform the scientific community about the project results through publications in proceedings and engage attendees through public presentations promoting scientific and technical discussions. During the first year of WeLASER project activities were developed in this area (Table 5.2).

Table 5.2 International conference papers and presentations

Presentation at the IIRB (International Institute of Sugar Beet Research) online seminar held on 4th of May: "Laser applications for sustainable plant production" (LZH, M. Wollweber). https://www.iirb.org/fileadmin/IIRB/Seminars/2021/Programme_IIRB_Seminar_2021.pdf
Presentation at "Sustainable Agriculture and Natural Resources" online cluster event organized by the European Research Executive Agency (REA), and held on May 20, 2021 (attended by WeLASER project coordinator and the Technical & Innovation manager).
Presentation at the 107th Congress of Italian Society of Physics held online 13-17 September 2021. (UNIBO, G. Vitali). IoT in Environmental Physics - Book of Abstracts - ISBN: 978-88-7438-127-2 - pg.309.
Presentation at "H2020 Plant Health related projects" online cluster event organized by the European Research Executive Agency (REA) in cooperation with the European Commission (DG Agriculture and Rural Development), and held on September 23, 2021 (attended by WeLASER project coordinator, the Technical and Innovation Manager, the Dissemination manager, and WP6 (Knowledge spread and innovation management) leader).

5.1.3. Special sessions in international conferences

Two special sessions as a part of several relevant conferences are planned in the second and third year of the project. In these sessions, the researchers and engineers involved in the project will be invited to make presentations on scientific and technical aspects related to the progress and outcomes of their work in the project.

5.1.4. Summer Schools

A one-week Summer School will be organized in month M36 in Spain (CSIC) with a twofold objective: to promote the project results and to train future system managers and technicians.

5.1.5. Lectures in MSc and PhD courses

This activity is focused on lectures and presentations at different levels (undergraduate, graduate, M.Sc. and Ph.D.) to engage the student community, as it is of paramount importance for training new professionals and covering the new expected jobs. Graduates are valuable as technicians and M.Sc. and Ph.D. as prospective researchers in the field. During the first year of WeLASER project, some courses included presentation and discussions of WeLASER concept (Table 5.3).

Table 5.3 Lectures in MSc and PhD courses

Type of activity	Name of the activity	Reference	Place
Course	Grundkursus i plantebeskyttelse (Basic course in plant protection)	5440-B4-4F21;	UCPH
Course	Pesticide Use, Mode of Action and Ecotoxicology	5440-B3-3F21	UCPH
Course	Afgrødelære (Crop Science)	5440-B4-4F21;	UCPH

5.1.6. Patents

The knowledge generated in WeLASER will be analysed by the Project Management Team to decide what results are to be protected and what results could be disseminated. The strategies for both protection and dissemination of results are set up in the IPR management strategy.

5.1.7. Participation at external related events

The consortium participates in the main technical exhibitions and fairs with the specific goal of promoting contacts and disseminating the achievements to industrial and professional associations. The main exploitable outcomes of the project will be presented at the fair best fitted to the end of the project.

5.1.8. Field and training days

During the last year of the project, two (2) field days will be organized by COAG (Spain), one (1) by UCPH (Denmark) and one more (1) by VDBP (The Netherlands) devoted to farmers. The objective is to allow farmers to be familiar with the WeLASER system and, thus, promote its use. However, as part of the Multi-Actor Approach strategy, contact with the farmers has been continuously carried out. COAG, the farmer's association involved in WeLASER, keeps informed their represented farmers and other farmer's associations in other EU countries and receives feedback from their needs and expectations.

5.1.9. WeLASER stakeholder Event

As a part of the Multi-Actor Approach strategy, five (5) stakeholder events are planned. During the first year of the project the first event was organised by COAG on November 26th 2020 and by IETU on May 25th 2021. Due to COVID-19 restrictions these events were held virtually. The rest of the stakeholder events will take place in Italy, Spain and Germany.

The First Stakeholder Event was organised by COAG on November 26th, 2020. The main objectives were to (i) stimulate the involvement of stakeholders in the decision level of the consortium and (ii)

include the stakeholders in the definition of the system characteristics. Over a total of 60 participants, 21 stakeholders, joined together in this first event. The information provided to the stakeholders, the discussion and the stakeholder assessment are detailed in deliverable D1.1-Multi-actor involvement plan and activities (I).

The Second WeLASER Stakeholder event was organized by IETU and held virtually on May 25th, 2021. The discussion was focused on (i) the security and safety issues, (ii) infrastructures needed for efficient performance of the robot, (iii) barriers and economic opportunities for implementation of the WeLASER system. Legal and practical aspects of agro-robotics safety, the efficiency of the machine and economics were presented by invited experts and consortium members. In addition, a panel discussion was held with farmers focusing on barriers and challenges for the real application of the WeLASER system. Over 40 professionals representing end users, industry, researchers, policy makers and NGOs interested in this project got together in this event. The meeting discussion and the stakeholder assessment are detailed in deliverable D1.1-Multi-actor involvement plan and activities (I).

5.1.10. Newsletter

A newsletter is planned to be compiled in the agreed format and distributed worldwide every six months. It will be published in all official languages of the consortium countries.

The first newsletter was released on M6, March 2021 and provided in some of the most representative languages of the EU. It was distributed to targeted audiences through WeLASER social networks, partner social networks, mailing lists and it is available in WeLASER website:

<https://welaser-project.eu/newsletter/>

The Newsletter was sent to 220 COAG's local offices in Spain and 31 organizations in Europe via European Coordination Via Campesina (ECVC, <https://www.eurovia.org/>). It was also sent to the project stakeholder email list.

5.1.11. Project flyer and posters

The WeLASER flyer was created and published in M2. It was widely disseminated at the beginning of the project to aware of potentially interested people of the existence of the WeLASER initiative and it is used in dissemination activities and distributed to targeted audiences during the project development. It is also available in WeLASER website.

https://welaser-project.eu/wp-content/uploads/2021/07/WeLASER-Flyer_English.pdf

The flyer was distributed to 31 organizations in Europe via European Coordination Via Campesina (ECVC, <https://www.eurovia.org/>) and to COPA-COGECA members (70 organizations in the EU <https://copa-cogeca.eu/>) via email.



WeLASER posters were designed for each of the stakeholder event and based on this roll-up design (Fig.4.5)



Fig. 5.1 WeLASER posters

5.1.12. Website

The project website www.welaser-project.eu is one of the most versatile dissemination tools; it was released in M2. The WeLASER website contains updated information for different audiences with three main purposes:

- (i) to provide external open information to interested professional parties on the project and its activities,
- (ii) to provide external open information to the general public and
- (iii) to provide both a private area for communication between the members of the consortium and a central repository of documents of several kinds, as restricted deliverables, presentations at project meetings and other project related information.

The WeLASER website aims at being a reference for people interested in the project objectives, activities and results. The WeLASER website is devoted to depict the project objectives, outline its main goals, define the roles of partners, state a timeline of work, etc. and is an essential mechanism for communication and dissemination of the project results. Furthermore, the website is properly updated the project work, communicating future events and news on the project progress and its activities.

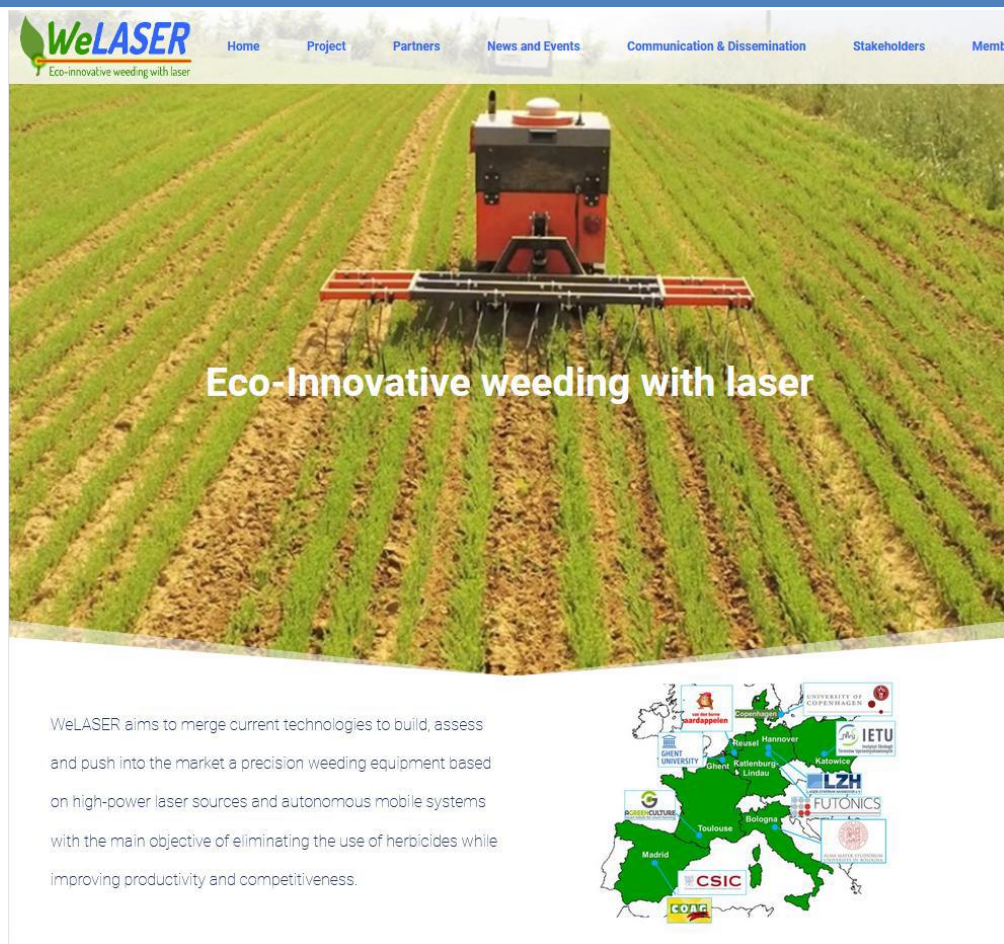


Fig. 5.2 WeLASER website home page

CSIC is the responsible partner for WeLASER website design and management. The main structure has been subcontracted according to the Grant Agreement. CSIC is in charge of updating the website as needed and is open to receive inputs and suggestions from the partners concerning the website contents. The set up and management of the information for the project website was detailed in Deliverable D6.1. Main statistics of WeLASER website are presented in Annex 2.

5.1.13. Social media

As part of WeLASER strategy in communicating and disseminating project activities and results to all the potentially interested parties, social media platforms are an active mean for sharing information quickly, efficiently and in real-time. Different types and pieces of information are broadcasted depending on both the characteristics of every platform and our objectives at dissemination time. CSIC is the responsible partner for WeLASER social media design and COAG is responsible for management. All WeLASER partners contribute, directly and through their own social media platforms, to enrich this online presence. WeLASER is present in the following platforms:

5.1.13.1. YouTube

YouTube is an online video-sharing platform that allows users to upload, view, share, add to playlists, report, comment on videos, and subscribe to other users. YouTube offers a wide variety of user-generated and corporate media videos. YouTube is an extraordinary tool to disseminate videos on project results. The WeLASER YouTube channel is accessed through the link

<https://www.youtube.com/channel/UCGtnXCI44WPgn15HCn5EamA/videos>

The WeLASER YouTube channel presents the aspect illustrated in Fig. 5.3. Main statistics of WeLASER Youtube channel are presented in Annex 2.

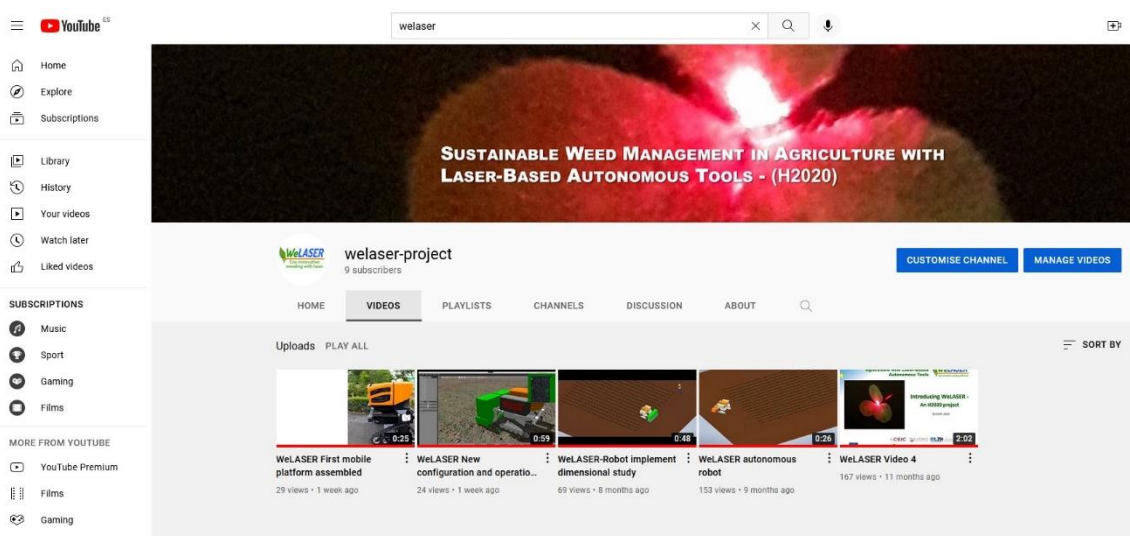


Fig. 5.3 WeLASER home page in YouTube

5.1.13.2. Twitter

Twitter is a microblogging and social networking service on which users post and interact with messages known as "tweets". Twitter is an effective way for quick communication. WeLASER twitter is accessed through <https://twitter.com/welaserproject>. Figure 5.4 illustrates the main page of WeLASER Twitter. Main statistics of WeLASER Twitter are presented in Annex 2.



Fig. 5.4 WeLASER home page in Twitter

5.1.13.3. Facebook

Facebook is an online social media and social networking service very effecting in communication. It is used for general text and picture communication. WeLASER Facebook can be accessed through the link https://www.facebook.com/Welaser-project-103771498170178/?modal=admin_todo_tour.

WeLASER main page in Facebook is illustrated in Fig. 5.5.

Main statistics of WeLASER Facebook page are presented in Annex 2.

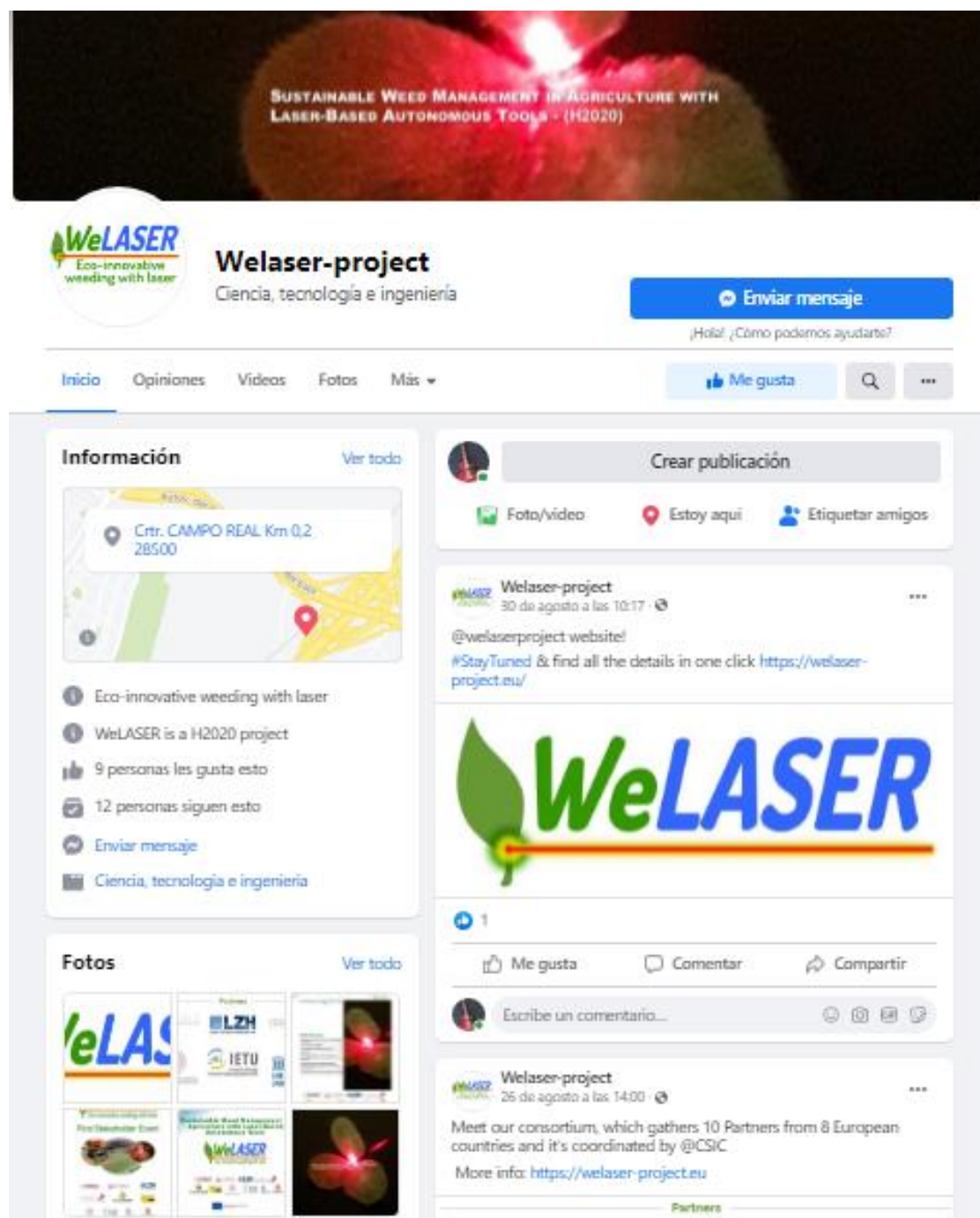


Fig. 5.5 WeLASER home page in Facebook

5.1.13.4. LinkedIn

LinkedIn is a business and employment-oriented online service used for professional networking. It is used for interaction with professionals. WeLASER LinkedIn is accessed through the link: <https://www.linkedin.com/company/welaser-project>

The home page is illustrated in Fig. 5.6. Main statistics of WeLASER LinkedIn are presented in Annex 2.

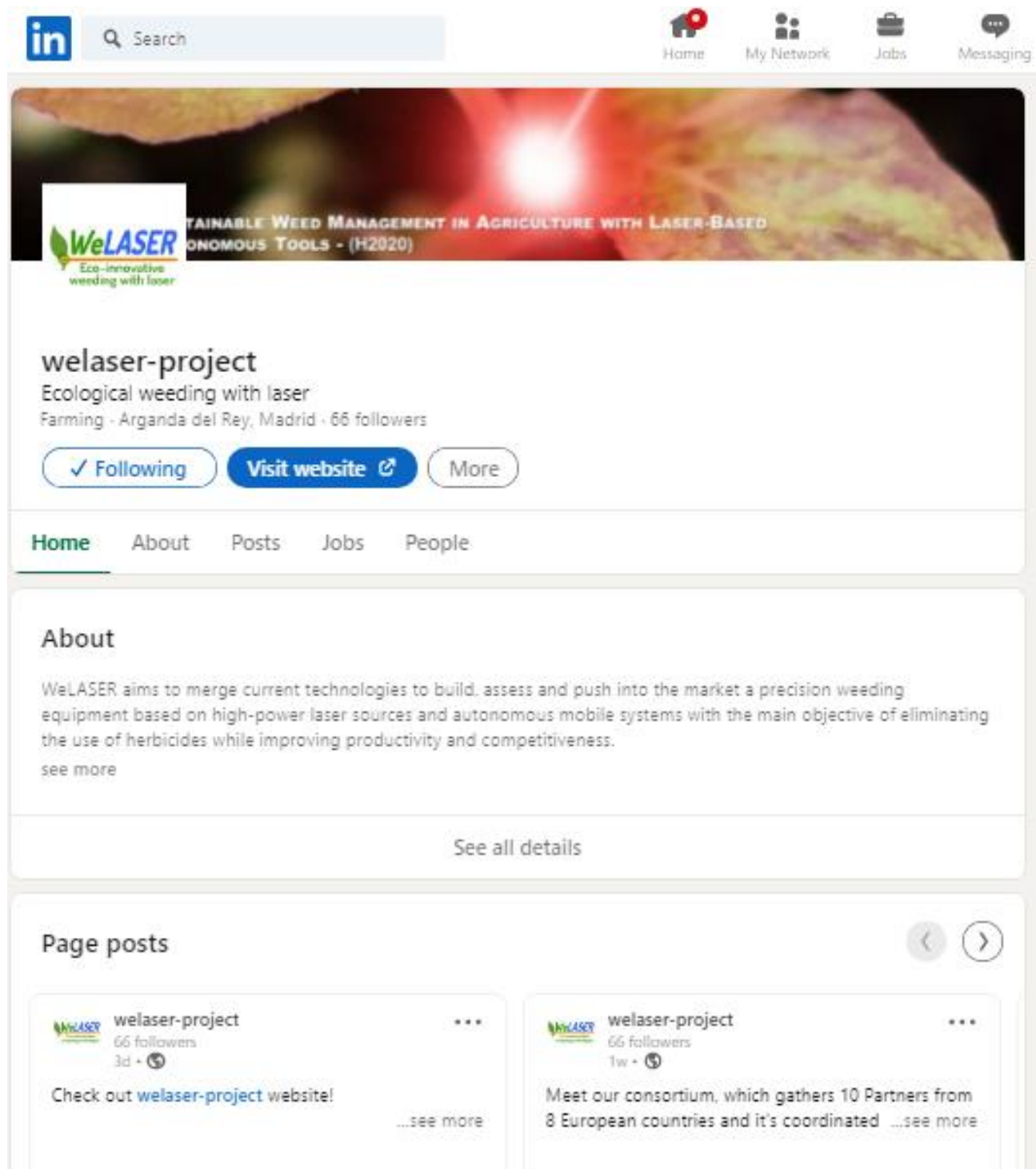


Fig. 5.6 WeLASER home page in LinkedIn

The project website and professional media platforms will be maintained by the WeLASER coordinator for at least 4 years beyond the project development. Expenses caused for this maintenance will be supported by the coordinator (CSIC) as a part of the project indirect costs.

5.1.14. General & Professional media

Companies, end users and general stakeholders are informed about the project findings through press releases published in the technical press, non-scientific and non-peer reviewed publications. Also general public is considered as a target and general media are also taken into account in the communication activities. WeLASER uses these important channels to reach the expected targets as it is summarized in Table 5.4.

Table 5.4 WeLASER Press releases and non-scientific and non-peer reviewed publications

Press releases	Partner
WeLASER: the technological solution that aims to end chemical treatments in the weed management https://welaser-project.eu/press-releases/	WeLASER
Nace "WeLASER", la solución tecnológica que pretende acabar con los tratamientos químicos en la eliminación de malas hierbas http://coag.chil.me/post/nace-e2809cweLasere2809d-la-solucion-tecnologica-que-pretende-acabar-con-los-tra-325945	COAG
Un proyecto del CSIC utilizará el láser para eliminar malas hierbas de los cultivos sin necesidad de pesticidas https://www.csic.es/es/actualidad-del-csic/un-proyecto-del-csic-utilizara-el-laser-para-eliminar-malas-hierbas-de-los	CSIC
WeLASER: Technische Alternative im Unkrautmanagement https://www.lzh.de/de/publikationen/pressemitteilungen/2021/welaser-technische-alternative-im-unkrautmanagement	LZH
Non-scientific and non-peer reviewed publications (popularised publications)	
CAMPO GALEGO: https://www.campogalego.es/welaser-la-solucion-tecnologica-que-pretende-acabar-con-los-tratamientos-quimicos-en-la-eliminacion-de-malas-hierbas/ INTEREMPRESAS https://www.interempresas.net/Horticola/Articulos/320261-COAG-colabora-tratamiento-suprime-completofitosanitarios-toda-aplicacion-quimica.html AGROINFORMACIÓN: https://agroinformacion.com/welaser-un-tratamiento-que-suprime-por-completo-los-fitosanitarios-y-toda-aplicacion-quimica-en-la-eliminacion-de-malas-hierbas/ AGRODIGITAL: https://www.agrodigital.com/2020/12/01/welaser-la-solucion-tecnologica-que-pretende-acabar-con-los-tratamientos-quimicos-en-la-eliminacion-de-malas-hierbas/ CAMPO DE ASTURIAS: https://www.elcampodeasturias.es/blog/2020/11/30/welaser-la-solucion-tecnologica-que-acabara-con-malas-hierbas-sin-tratamientos-quimicos/ INFOAGRO: https://www.infoagro.com/noticias/2020/investigan_un_tratamiento_suprime_por_completo_los_fitosanitar	

[ios_y_to.asp](#)

AGRONEWS CASTILLA Y LEÓN

<https://www.agrnewscastillayleon.com/coag-colabora-en-un-tratamiento-que-suprime-por-completo-los-fitosanitarios-y-toda-aplicacion>

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<https://profesionaleshoy.es/jardineria/2020/11/30/welaser-una-solucion-tecnologica-para-eliminacion-de-malas-hierbas-sin-tratamientos-quimicos/23410>

EI DÍA DE SEGOVIA:

<https://www.eldiasegovia.es/Noticia/Z8FB3A914-CBE6-92E8-9A838F9E7F73053E/202012/Nace-WeLASER-el-sistema-que-quiere-acabar-con-el-herbicida>

AGROBANK:

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CAMPO CASTILLA Y LEÓN:

<https://www.campocyl.es/category/sanidad-vegetal/nace-welaser-la-solucion-tecnologica-para-acabar-con-los-tratamientos-quimicos-y-eliminar-malas-hierbas/>

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INNOVAGRI:

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DIARIO DE ÁVILA:

<https://www.diariodeavila.es/Noticia/Z8FB3A914-CBE6-92E8-9A838F9E7F73053E/202012/Nace-WeLASER-el-sistema-que-quiere-acabar-con-el-herbicida>

LA TRIBUNA DE TOLEDO:

<https://www.latribunadetoledo.es/Noticia/Z8FB3A914-CBE6-92E8-9A838F9E7F73053E/202012/Nace-WeLASER-el-sistema-que-quiere-acabar-con-el-herbicida>

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DIE LINDE:

<https://dielinde.online/12638/laserstrahlen-statt-pestizide/>

DEUTSCHER PRESSE INDEX:

<https://www.deutscherpresseindex.de/2021/03/25/welaser-technische-alternative-im-unkrautmanagement/>

OPTICS.ORG

<https://optics.org/news/12/3/52>

F3

<https://f3.de/future/laserstrahlung-alternatives-unkrautmanagement-1300.html>

LASERSYSTEMS EUROPE

<https://www.lasersystemeurope.com/feature/how-can-ai-benefit-industrial-laser-systems-users>

FUTURE FARMING

<https://www.futurefarming.com/tech-in-focus/welaser-robot-to-kill-weeds-using-a-powerful-laser/>

ELECTRO OPTICS

<https://www.electrooptics.com/news/ai-powered-lasers-remove-weeds-fields>

LASERSYSTEMS EUROPE

<https://www.lasersystemeurope.com/news/ai-powered-lasers-remove-weeds-fields-0>

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IDEX-HS

<https://www.idex-hs.com/news-events/industry-news/welaser-project-refines-laser-based-weed-control/>

CORDIS

<https://cordis.europa.eu/project/id/101000256/fr>

KONSTRUKTION & ENTWICKLUNG

<https://www.konstruktion-entwicklung.de/so-wird-der-laser-zum-autonomen-unkrautvernichter>

Non-scientific and non-peer reviewed publications in technical press

P. González de Santos, Luis Emmi, Roemi Fernández, La utilización del láser como alternativa sostenible a los herbicidas: Proyecto WeLASER, Tierras, Nº 294, pp. 56-60, 2021, ISSN 1889-0776 / 269-3752 (digital). In Spanish.

5.1.15. Practice Abstracts

An important part of the dissemination activities is devoted to the elaboration and issue of the “Practice Abstracts” of the Agricultural European Innovation Partnership (EIP-AGRI) common format to be made available to the interested communities through the on-line EIP-AGRI database. The EIP-AGRI common format facilitates knowledge flows on innovative and practice-oriented projects from the start till the end of the project. The use of this format also enables farmers, advisers, researchers and all other actors across the EU to contact each other. WeLASER Practice Abstracts are available on the EIP-AGRI website (<https://ec.europa.eu/eip/agriculture/en/find-connect/projects/sustainable-weed-management-agriculture-laser>) and on the WELASER website as indicated in Table 5.5, which contains the title and links of the Practice Abstracts issued during the first year of the project.

During the first year of WeLASER project several Practice Abstracts issued (Table 5.5).

Table 5.5 WeLASER Practice Abstracts

	Title	Link
PA1	An efficient and profitable weeding system friendly with the environment and health: WeLASER project is on its way.	https://welaser-project.eu/download/pa-1_english/
PA2	Stakeholders help defining the WeLASER system specifications	https://welaser-project.eu/download/welaser-pa-2-english/
PA3	Selecting target crops for laser weeding testing	https://welaser-project.eu/download/welaser-pa-3-english/
PA4	Selecting plants for the initial laser-weeding test	https://welaser-project.eu/download/welaser-pa-4-english/
PA5	Strategies for weeding with laser	https://welaser-project.eu/download/welaser-pa-5-english/
PA6	IoT in robotic systems for agriculture	https://welaser-project.eu/download/welaser-pa-6-english/
PA7	Cloud Computing in robotic systems for agriculture	https://welaser-project.eu/download/welaser-pa-7-english/
PA8	Laser technology for weed management	https://welaser-project.eu/download/welaser-pa-8-english/
PA9	Weed management – safety requirements for laser outdoor usage	https://welaser-project.eu/download/welaser-pa-9-english/
PA10	Extending agricultural robot capabilities for weeding with laser – WeLASER navigation strategies	https://welaser-project.eu/download/welaser-pa-10-english/
PA11	Stakeholders provide insight into key aspects of WeLASER implementation in practice	https://welaser-project.eu/download/welaser-pa-11-english/
PA12	Laser weeding in organic production	https://welaser-project.eu/download/welaser-pa-12-english/
PA13	Futronics develops a new high-power laser module for weed eradication	https://welaser-project.eu/download/welaser-pa-13-english/
PA 14	PESTEL analysis of the WeLASER solution	https://welaser-project.eu/download/welaser-pa-14-english/
PA 15	IoT for safe robotic agriculture	https://welaser-project.eu/download/welaser-pa-15-english/
PA 16	Integration of IoT and robotic data	https://welaser-project.eu/download/welaser-pa-16-english/

5.2.Future activities

Future communication activities will be reported in D6.3 and D6.4 in months M24 and M36, respectively.

6. DISSEMINATION AND COMMUNICATION MONITORING

Table 6.1 Measurements (KPI) to assess dissemination during months M1-M12 of the project development

Key Performance Indicators					
Target audience	Type of dissemination activity	Measurement	Months 1-12		Total in the project
			Current measures	Grant Agreement	
The Scientific Community	Journal articles	Number of articles	2	6	42
		Number of citations	2	6	42
		Text views	5.386 ²		
	International conference papers and presentations	N. of papers/presentations	4	6	36
		Number of citations	-	3	21
	Special sessions in international conferences	Number of special sessions	-	-	2
	Summer School	Number of students	-	-	30
Student community	Lectures in MSc courses	Number of courses	-	5	17
	Lectures in PhD courses	Number of courses	3	5	17
The Industrial Community	Patents	Number of applications	-	-	2
	Technical and general press	Number of appearance	1 ³	12	60
		Number of references	32 ³	20	110
	Participation at external related events	Number of events	-	3	5
The end users	Dissemination to farmers	N. of field and training days	-	-	3
The general stakeholders	Newsletter	N. of copies sent/downloaded/views	- 58 views on the project website. - 34 downloads. - 220 offices and 31 organizations ⁴ - 25 stakeholders	300	1200
	The project flyer and posters (Flyer and	N. of copies sent/downloaded	- 220 offices and 101 organizations	400	1500

² See metrics at the article links in section 5.1.1.

³ See "Non-scientific and non-peer reviewed publications" and "Non-scientific and non-peer reviewed publications in technical press" in section 5.1.14.

⁴ The Newsletter was sent to 220 COAG's local offices in Spain and 31 organizations in Europe via European Coordination Via Campesina (ECVC)

	Poster)		5		
	Project Website	Website visits	3,5K visits 907 users ⁶	2000	11000
	Practice Abstracts	Number	16		72
	Social media	Followers/tweets/etc.	Twitter: 55 Followers 63 tweets Youtube: 9 subscribers 5 videos 401 views Facebook: 12 followers Linkedin: 69 followers		
	Professional media	Number of messages/videos/Press releases	509 ⁷	500	1750
	General media	Evidence of debates in the media	-	3	10

KPI and measurement indicators during months M1 to M12 of the project development show that dissemination and communication efforts must be improved in the following period. Dissemination and Communication plan will be revised in the next General Assembly and specific measures will be taken, in other to optimise these actions and achieve the expected impact.

7. EXPLOITATION PLAN

In the first year, we focused on the top-down analysis of the market research for the innovative weed control application developed in the WeLASER project. To this extent, we produced two internal reports for the market analysis namely PESTEL analysis and preliminary competitiveness analysis. The PESTEL analysis report constitutes a comprehensive view of six main factors that affect the prospect of the WeLASER application namely political, economic, social, technological, environmental, and legal factors (see section 7.1 for a summary). In the preliminary competitiveness analysis, we assessed the potentials of the WeLASER application in comparison to its indirect and direct competitors (see section 7.2 for a summary). These two reports are corresponding to the first steps of the exploitation plan where the market research is the key to identify the efficient pathway for implementation of the WeLASER innovation.

⁵ The flyer was distributed to 31 organizations in Europe via European Coordination Via Campesina (ECVC) and to COPA-COGECA members (70 organizations in the EU) via email

⁶ See Google Analytics Report in section 5.1.12.

⁷ According to sections 5.1.13 and 5.1.14

As the market data remain lacking and the target technology in this project is still at a nascent stage, the bottom-up approach for market analysis will be employed in the later stage of the project. In this regard, we are collaborating closely with WP1 in organizing focus group discussions and computer assisted telephone interviewing (CATI) survey to collect market data for further analysis. The primary data would be crucial to identify the actual market demand with a clear market size and penetration rate of the WeLASER application in the market of weed control machinery. Also, the economic assessment in the Task 1.3 will provide necessary data from cost-benefit analysis and investment analysis to critically choose appropriate business models and detail a business plan for exploitation phase of the WeLASER application. Based on mentioned updated data, the fine-tuning analyses will be integrated in the next periodic report in D6.3.

7.1. PESTEL analysis

The combination of different technologies from the Internet of Things (IoT) to precision agriculture makes the WeLASER solution having unique competitive advantages compared to the current weed control practices. The WeLASER solution can address pressing issues such as herbicide-resistant weeds, soil damage due to the impacts of mechanical weeders, health issues related to overuse of chemical herbicides, the high cost of manual weed control, and so on. However, the novelty in this new technique can also raise concerns regarding the readiness of the technology, its economic potential to implement in a real-life setting, and the required legislation to adopt it. Thus, PESTEL analysis is employed to shed the light on the mentioned external environmental issues related to the prospect of the WeLASER solution.

PESTEL analysis is a multifaceted approach to provide the general picture of factors that affect the prospect of a focal organisation or an industry. PESTEL analysis takes into consideration six categories of external environmental factors corresponding to its acronym: Political (P), Economic (E), Social (S), Technological (T), Environmental (E), and Legal (L). By assessing these six factors, this tool provides an overview of the macro-environmental factors that a focal organisation (a company) can use to make informed decisions for tailoring its strategic plans. Table 7.1 summarises the research subjects with their corresponding categories that were captured in this report.

This report takes into consideration both primary and secondary data. The primary data were derived from the first and second stakeholder events in the WeLASER project. The first stakeholder event was organised virtually on 26th November 2020 with the discussion focusing on the technological aspects of the WeLASER vehicle. The second stakeholder event took place on 25th May 2021 and emphasised socio-economic-legal aspects of the WeLASER application. The secondary data for this report comprises diverse sources, namely scientific studies; reports of political initiatives; industry initiatives and associations; and NGOs, media information.



Table 7.1 Research categories for PESTEL in correspondence with specific research subjects

PESTEL category	Research subject
Political	<ul style="list-style-type: none"> – Political aspects regarding trends in organic and sustainable farming (e.g. reduction in synthetic herbicides)
Economic	<ul style="list-style-type: none"> – General market conditions and economic factors in organic farming – Business model trends for agricultural machinery – The acceptance of farmers as the end-users of the technology
Social	<ul style="list-style-type: none"> – Safety for humans, animals, and surrounding subjects – Relation between agricultural labour employment and autonomous weed control
Technological	<ul style="list-style-type: none"> – Technological trends and needs in weed control – Development of new and/or competing technologies
Environmental	<ul style="list-style-type: none"> – Interaction with the environment and environmental impacts related to the laser de-weeding machine
Legal	<ul style="list-style-type: none"> – Considering the existing legislation for the WeLASER vehicle

Source: Adapted from Hunger (2012)⁸

The PESTEL analysis indicates that the WeLASER project has a great potential for future exploitation due to the favourable political and economic landscape for organic farming and sustainable weed control. However, several issues should be addressed along the project to successfully implement the WeLASER vehicles. The current legislation regarding AI and autonomous agri-bots still needs to be discussed and elaborated to deal with the unprecedented scenarios in this field. The most important issues for the future of WeLASER would be to ensure the cost-effectiveness of the application and tailor efficient business plans for the exploitation phase. As the initial stage of the technology development, the WeLASER does not focus on the cost reduction of the technology but rather emphasise the full development of an effective solution to weed control using autonomous vehicles which can precisely kill weeds by laser beams. Therefore, the economic analysis in the WeLASER project will be served as preliminary inputs for later consideration of adapting the WeLASER system to market demand. Also, the economic analysis can provide solid proof of the potential of the WeLASER solution, which is crucial to obtain the funding for the following stage of the project.

7.2. Competitiveness analysis

To detail a business plan for the WeLASER application, it is important to assess the competitiveness of the WeLASER vehicle in comparison to the current competitors in the market. To this extent, the

⁸ Hunger, D. J. (2012). *Strategic management and business policy*. Pearson Education.

competitiveness analysis is crucial to refining the marketing strategy and vividly illustrate the realistic potential of the new product in the market as this analysis identifies the unique selling points of the product of interest.

Given the diverse weed control applications in the market, it is difficult to comprehensively identify the main competitors of the WeLASER vehicle. In this competitiveness analysis report, we aim to analyse the competitiveness of the WeLASER application in two folds. Firstly, we compare the WeLASER application with the general groups of indirect competitors namely the chemical, mechanical, and other physical weed control approaches. This comparison will be detailed in Table 7.2. Also, we compile a set of innovative weed control applications from different reports and market insights to provide a glimpse of the current development stage of the weed control machinery industry (Table 7.3). Secondly, we compare the WeLASER application with its direct competitor(s) using CO₂ laser system for laser-weeding treatments (See Table 7.4).

This preliminary competitiveness analysis indicated the advantages and disadvantages of the WeLASER application in comparison with other indirect and direct competitors in the field of weed control machinery. In essence, the WeLASER application possesses several advantages thanks to its advanced technologies in automation and precision agriculture. Also, the political landscape favouring organic farming provides a comparative advantage for sustainable approaches like the WeLASER application. However, the limits in terms of slow operation speed and high investment cost can hinder the adoption of the WeLASER vehicle in the exploitation phase.

As the market of weed control machinery is rapidly evolving along with the technologies in automation and precision agriculture, this competitiveness analysis will be updated accordingly. Besides, as the WeLASER vehicle is still under development, the technical figures and estimated costs of the vehicle remain unclear. To this extent, the specification of the WeLASER vehicle can also be modified during the project.

During the following periods of the project, we will conduct interviews with the machinery developers, end users, and other stakeholders to better understand the potential of the WeLASER application as the final specification will be getting clearer. Based on the future findings from literature review and primary data from interviews, we will be able to elaborate the competitiveness analysis with a clear scientific underpin. Also, in this current competitiveness analysis report, we only emphasize on the technology aspects in our comparison. In the next updated version of the report, we aim to employ a customer-oriented approach to acquire a holistic analysis on the competitiveness of the WeLASER application. In conclusion, this report is a preliminary work and will get updated during the course of the project.



Table 7.2 Summary of the comparison among weed control approaches

Features	WeLASER	Other physical control	Mechanical control	Chemical control
Effectiveness with in-row weeding	Fully	Without AI sensors, often limited. Except in the case of complementing with precision seeding.	Without AI sensors, often limited. Except in the case of complementing with precision seeding.	Without AI sensors, often limited. Except in the case of complementing with precision seeding.
Speed	Fast	Mostly fast, except for precision methods.	Mostly fast, except for precision methods.	Mostly fast, except for precision methods.
Accuracy/ Precision	Highly accurate	Normally low, can be improved if having support from precision-seeding or AI sensor.	Normally low, can be improved if having support from precision-seeding or AI sensor.	Normally low, can be improved if having support from precision-seeding or AI sensor.
Organic farming	Yes	Yes	Yes	No, except using organic herbicides
Agricultural trends	Favoured	Favoured	Favoured	More stringent regulation for chemical use
Mobility	Fully autonomous	Autonomous / Mounted onto tractors/ Manned controlled	Autonomous / Mounted onto tractors/ Manned controlled	Autonomous / Mounted onto tractors / Manned controlled
Energy consumption for operation	High	High	Low to moderate	Low to moderate
Initial investment cost	High	High, especially if including precision and automation application.	Moderate, if not including precision and automation application.	Low due to inexpensive herbicides, if not including precision and automation application.
Development phase	Testing	A few marketed, mostly testing	Mostly marketed	Mostly marketed

Source: Self-compilation

Table 7.3 Some innovative weed control applications in the current market

#	Category ^a	Machine (company)	Country	Main features
1	C	AVO (ecoRobotix)	Switzerland	Using machine learning, the robot detects, and selectively sprays the weeds with a micro-dose of herbicide.
2	C/M	Robotti (Agrointelli)	Germany	Mechanical weeding and band-spraying/spraying. Supported by a reliable and powerful diesel and hydraulic system. Using Lidar scanners, emergency stops, and cameras for live monitoring.
3	M	Dino (Naio technology)	France	Inter-row weeding, autonomously navigate, remote mission supervision, electric batteries.
4	M	FD20 (FarmDroid)	Germany	High precision RTK-GTS, seeding system, weeding system for inter-row and intra-row weeding, CO2-neutral operation using solar power.
5	M	Weed Whacker robot (Odd.bot)	The Netherlands	Autonomous mechanical in-row weeding for high-density crops (stamper/pusher, puller, pucker) using AI and machine learning with Delta arm robots.
6	P	HarryV1 (Small robot company)	United Kingdom	Electrical weed control using ZAP
7	P	Annihilator (The Weed Zapper)	The United States	Using electric shock to kill weeds

^a Weed control approach: M = Mechanical control, C = Chemical control, P = Physical control.

Source: Self-compilation



Table 7.4 Comparison between the vehicle of WeLASER and that of CO₂ laser system

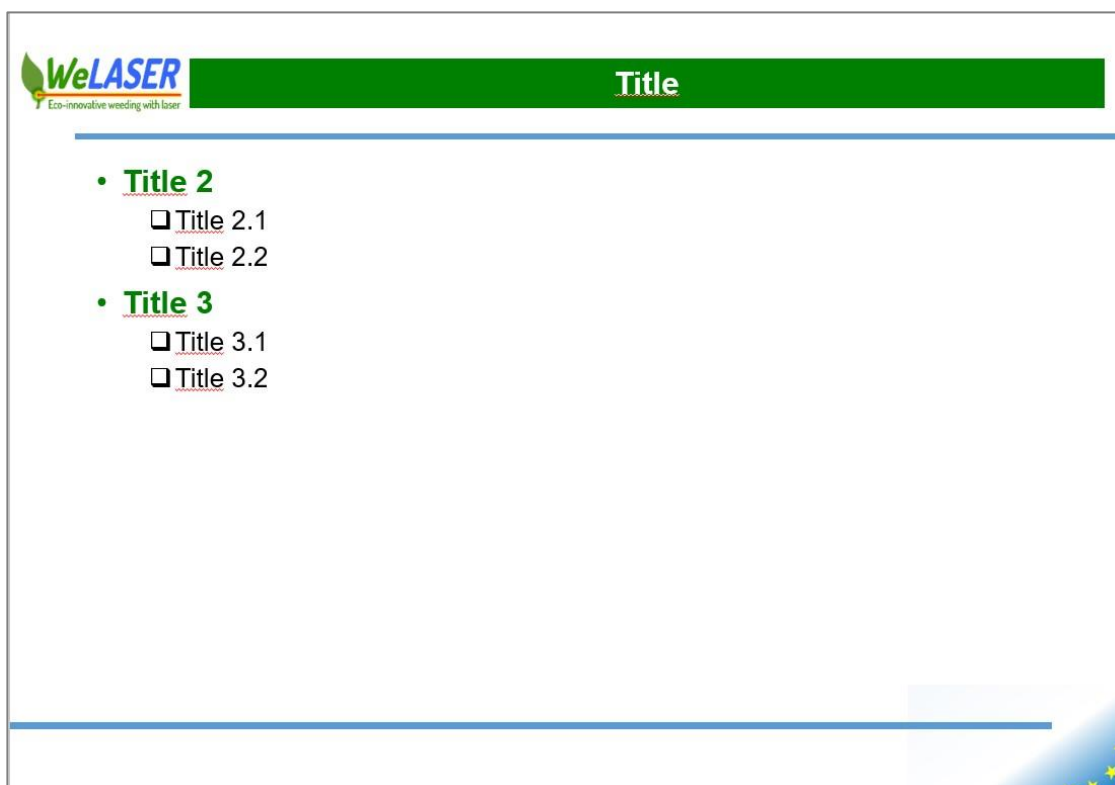
	Fibre laser system (WeLASER)	CO₂ laser system
Type of laser	Fibre laser	CO ₂ laser
Cost-effectiveness	A simple system requires low maintenance costs and less energy consuming.	A complex system requires more maintenance costs and consumes more energy.
Weight	Smaller, more flexible	Heavier, potentially damage soil
Speed	Fibre laser: Quicker speed for thin material compared to CO ₂ laser.	CO ₂ laser: Slower for thin materials but more effective for thick materials.
Price	Unknown for the first prototype	Not available in Europe yet
Development phase	Ongoing development process	Marketed

Source: Self-compilation


8. ANNEXES

8.1. Annex 1 – WeLASER Templates

8.1.1. POWER POINT format template for presentations




8.1.2. WORD format template for deliverables



Sustainable Weed Management in Agriculture with Laser-Based Autonomous Tools

DX.Y – Title

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Acknowledgements

WeLASER is a project co-funded by the Horizon 2020 Research and Innovation Programme of the European Union under the call "Fuel security, sustainable agriculture and forestry, marine and maritime and inland water research and the bio-economy" and the topic "Integrated health approaches and alternatives to pesticide use" (H2020-SFS-04-2019-2020) Grant agreement N. 101000216


Disclaimer

The views and opinions expressed in this document are solely those of the project, neither of the European Commission.

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Work package Task	WPY
Work package leader	CSIC
Deliverable type *	
Dissemination level**	
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* Report Privileged/Dissemination: Other
**Public: Intended to other programme participants (including the Commission Services). Restricted to a group specified by the contributor (including the Commission Services). Confidential: only for contributors/ beneficiaries (including the Commission Services).

8.1.3. WORD format template for the agendas and minutes of the meetings



Sustainable Weed Management in Agriculture with Laser-Based Autonomous Tools

AGENDA OF THE KICK-OFF MEETING AND THE GENERAL ASSEMBLY

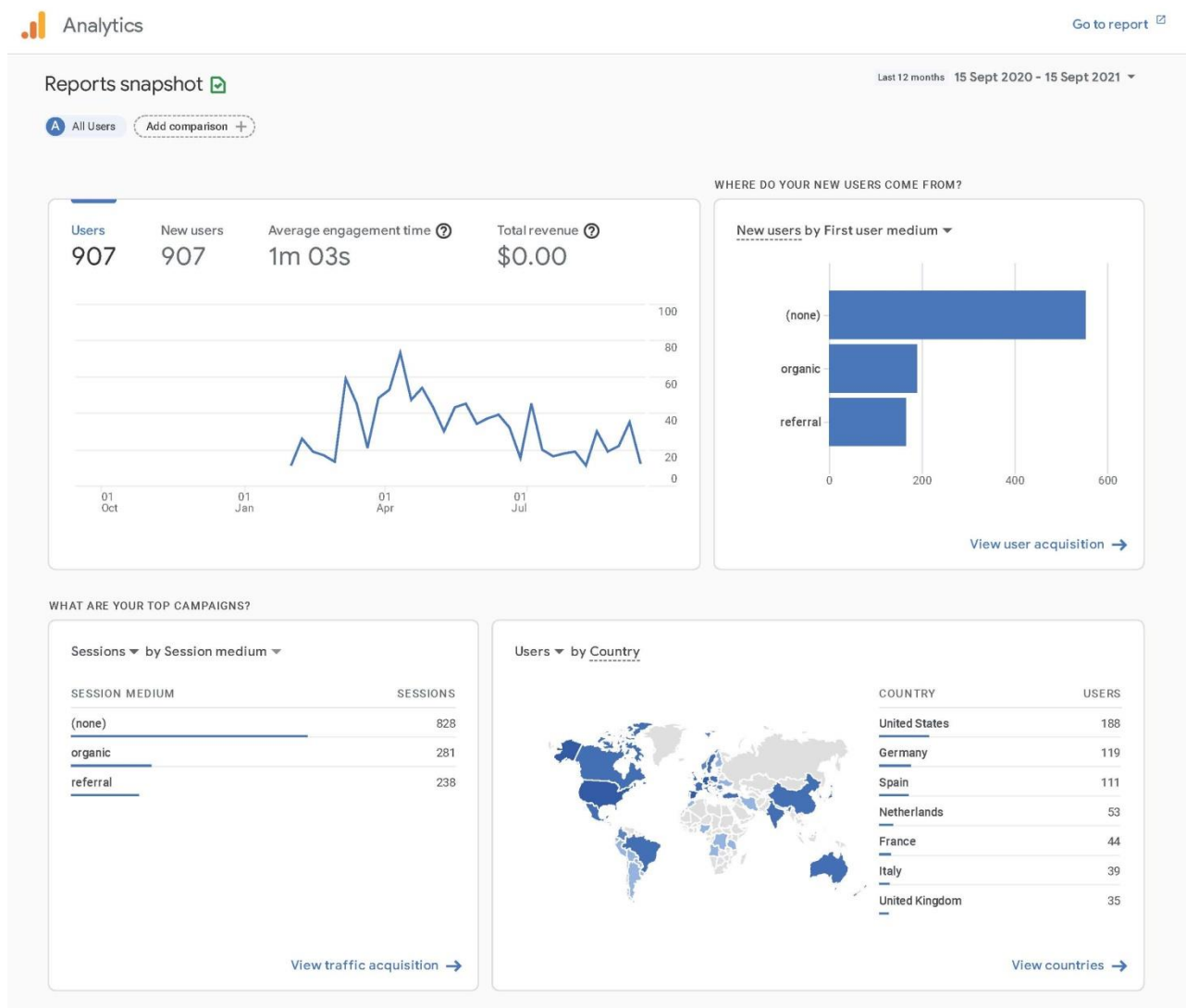
Videoconference
October X, 2020

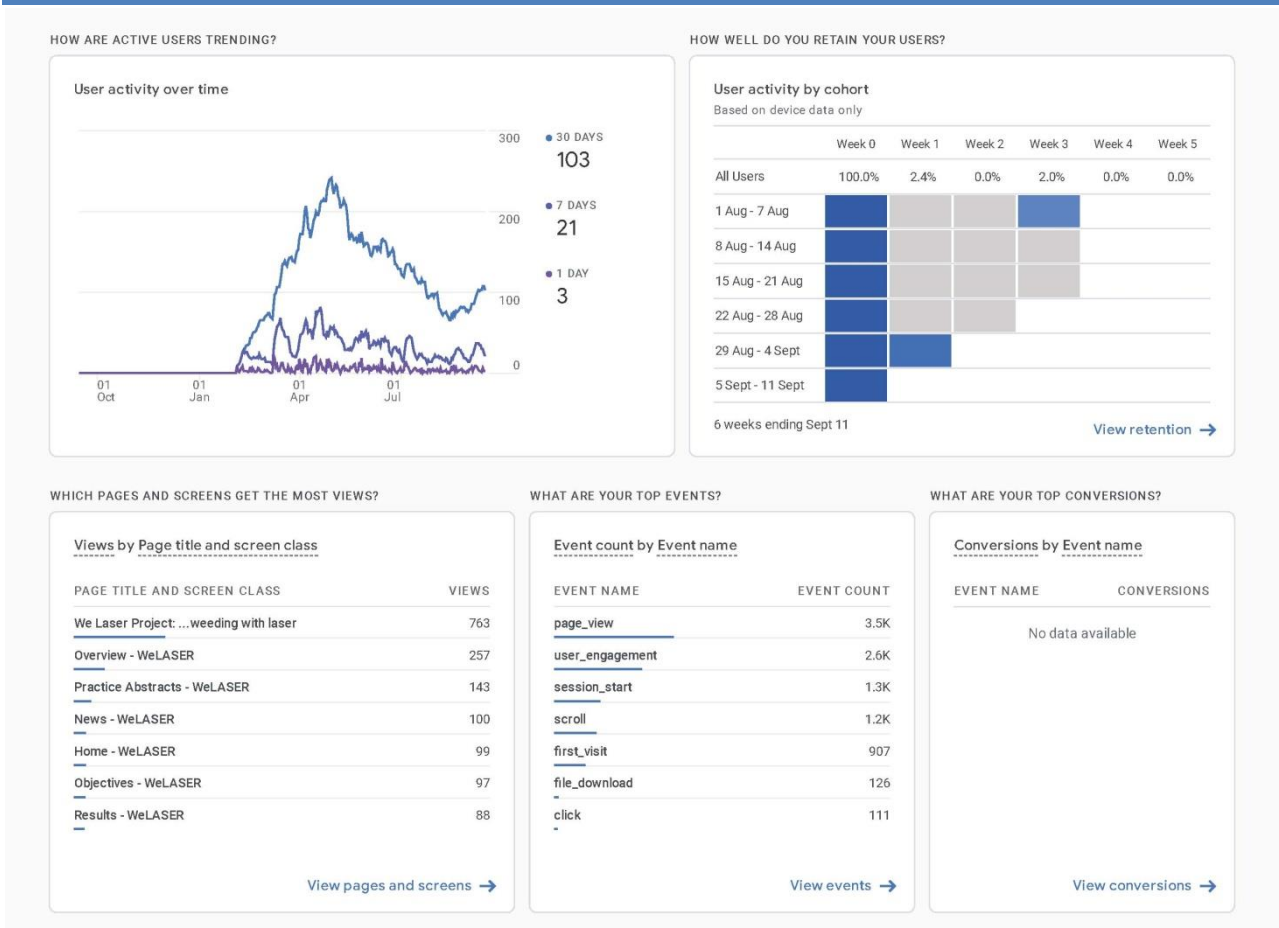
DAY 1 - October X, 2020

10:00 – 10:15	Welcome and WeLASER	Pablo GONZALEZ-DE-SANTOS (Project coordinator)
10:15 – 10:30	EC and H2020 general information	Sylvia GEMINI (EC project officer)
10:30 – 11:30	Presentation of the consortium A five-minute presentation per beneficiary following the template WeLASER-Beneficiary presentation (acronym). Please, use a few slides with the content: 1.- Description of the organization; 2.- Main projects and products of the group and 3.- Role in WeLASER.	1-CSIC: Pablo GONZALEZ-DE-SANTOS 2-FUT: Karsten SCHOLLE 3-LZH: Merve WOLLWEBER 4-UCPH: Christophe AUBE 5-AGC: Cristiano VITALI
11:30 – 11:40	Break	
11:40 – 13:00		
		Karsten SCHOLLE (FUT)
		Merve WOLLWEBER (LZH)
		Christophe AUBE (UCPH)
		Pablo GONZALEZ-DE-SANTOS (CSIC)
		Cristiano VITALI (UNIBO)

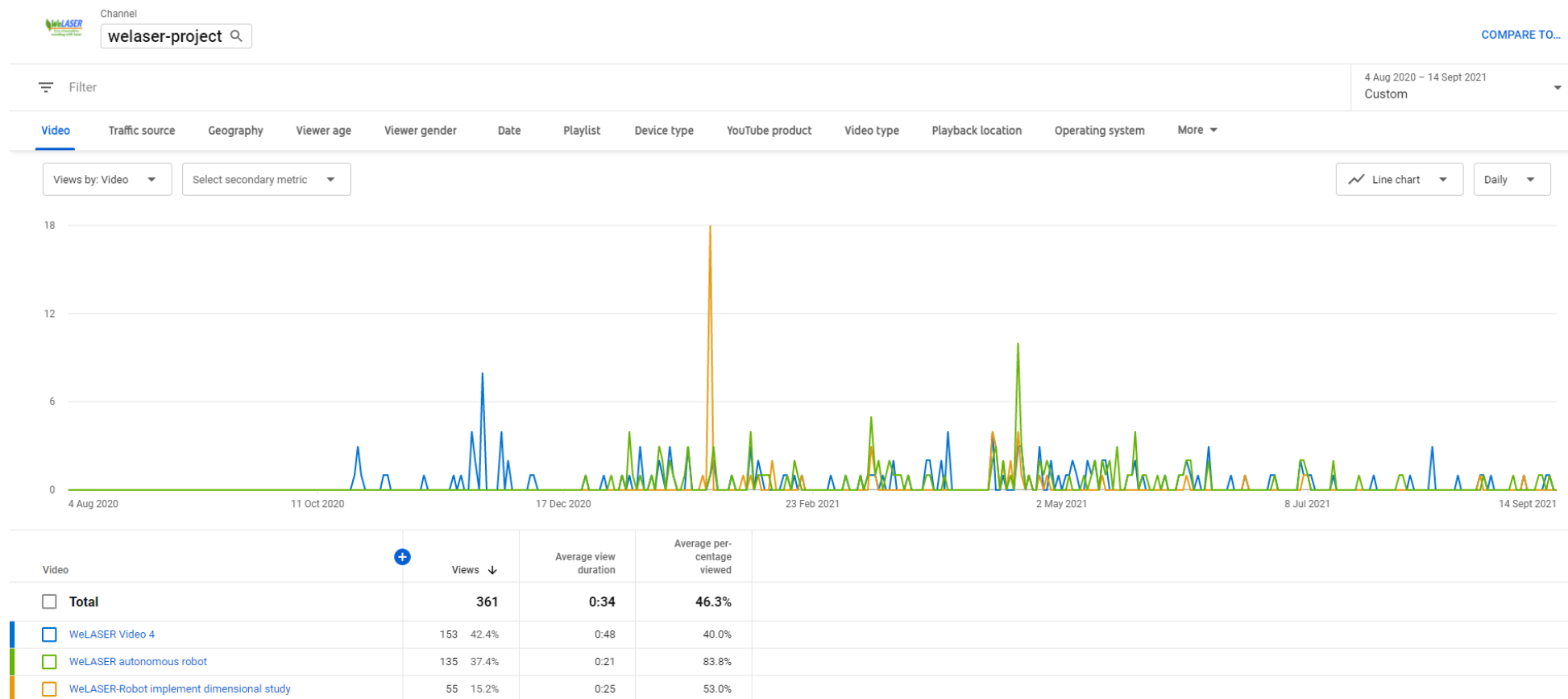
8.2. Annex 2 – WeLASER websites and social media statistics

8.2.1. Website





8.2.2. Youtube



8.2.3. Twitter

Your Tweets earned **2.1K impressions** over this **28 day** period



YOUR TWEETS
During this 28 day period, you
impressions per day.

Sep 2021 • 23 days so far...

TWEET HIGHLIGHTS

Top Tweet earned 689 impressions

#WeLASER
(<https://twitter.com/hashtag/WeLASER?src=hash>) already published 12
#PracticeAbstracts
(<https://twitter.com/hashtag/PracticeAbstracts?src=hash>)! Curious about them? Read more here welaser-project.eu/practice-abstr... (<https://t.co/VYsj7jNV1Y>)

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@HorizonEU
(<https://twitter.com/HorizonEU>)
[pic.twitter.com/HorizonEU](https://twitter.com/HorizonEU)
(<https://t.co/Jxi0gTjnV8>)



Laser weeding vs. mechanical weeding
Weeding with a laser makes good sense in organic production because laser-weeding can be based on electricity produced from renewables, hydropower or other non-fossil energy sources and thereby contributed to an environmentally friendly production.
The laser beam is only directed against the growth point of the small emerging weed plants, which is a very small spot between the first leaves. Therefore, laser weeding interferes as little as possible with the environment in contrast to mechanical weed control, which also harms beneficial organisms

(<https://twitter.com/welaserproject/status/1435133481781284865>)
4 5

View all Tweet activity (/user/welaserproject/tweets)

View Tweet activity

Top Follower followed by 7,709 people

(https://twitter.com/EIPAGRI_SP)



(https://twitter.com/EIPAGRI_SP)

EIP-AGRI ServicePoint

(https://twitter.com/EIPAGRI_SP)

FOLLOWS YOU
The European Innovation Partnership on Agricultural Productivity & Sustainability (EIP-AGRI) wants to help innovations spread across the EU faster **#EIPagri**
(<https://twitter.com/hashtag/EIPagri?src=hash>)

View profile (https://twitter.com/EIPAGRI_SP/)

Top mention earned 21 engagements

(<https://twitter.com/COAGInnova>)
COAG INNOVA
@COAGInnova
(<https://twitter.com/COAGInnova>) - Sep 2
(<https://twitter.com/COAGInnova/status/1433313992882130947>)
Meet **@welaserproject**
(<https://twitter.com/welaserproject>)
consortium, which gathers 10 partners from 8 European countries, including **@La_COAG** (https://twitter.com/La_COAG), and it's coordinated by **@CSIC** (<https://twitter.com/CSIC>) **@CARobotica_** (https://twitter.com/CARobotica_)
More info welaser-project.eu
(<https://t.co/6ftbVxVqFb>)
@LZH_Hannover
(https://twitter.com/LZH_Hannover) **@ugent**
(<https://twitter.com/ugent>) **@unibo**
(<https://twitter.com/Unibo>)
@uni_copenhagen
(https://twitter.com/uni_copenhagen)
@IETU4 (<https://twitter.com/IETU4>)
@AGC_Robotics
(https://twitter.com/AGC_Robotics)
@jacobvdborne
(<https://twitter.com/jacobvdborne>)
[pic.twitter.com/jacobvdborne](https://twitter.com/jacobvdborne)
(<https://t.co/kt5Aj3EGDR>)



(<https://twitter.com/COAGInnova/status/1433313992882130947>)
4 3

View Tweet

(<https://twitter.com/COAGInnova/status/1433313992882130947>)

Top media Tweet earned 315 impressions

Do you want know more about **@welaserproject**
(<https://twitter.com/welaserproject>) and just

ADVERTISE ON TWITTER

Get your Tweets in front of more people

Promoted Tweets and content open up your reach on Twitter to more people.

Get started (<https://ads.twitter.com/log>)

SEP 2021 SUMMARY

Tweets	3	Tweet impres	1,743
Profile visits	154	Mentions	2
New followers	3		

Aug 2021 • 31 days

TWEET HIGHLIGHTS

Top Tweet earned 1,494 impressions

🔗 Meet our consortium, which gathers 10 Partners from 8 European countries and it's coordinated by

@CSIC (<https://twitter.com/CSIC>)

@CARobotica_ (https://twitter.com/CARobotica_)

More info: welaser-project.eu
(<https://t.co/KixIzKiDZa>)

@La_COAG (https://twitter.com/La_COAG)

@LZH_Hannover

(https://twitter.com/LZH_Hannover) @ugent

(<https://twitter.com/ugent>) @unibo

(<https://twitter.com/Unibo>)

@uni_copenhagen

(https://twitter.com/uni_copenhagen)

@IETU4 @AGC_Robotics

(https://twitter.com/AGC_Robotics)

@jacobvdborne

(<https://twitter.com/jacobvdborne>)

[pic.twitter.com/BNJT11QFRL](https://twitter.com/BNJT11QFRL)

(<https://t.co/BNJT11QFRL>)


Top mention earned 32 engagements


(<https://twitter.com/COAGInnova>)

COAG INNOVA

@COAGInnova

(<https://twitter.com/COAGInnova>) - Aug 30

(<https://twitter.com/COAGInnova/status/1432225822534995970>)

🔗 @La_COAG

(https://twitter.com/La_COAG) forma parte

del proyecto **@welaserproject**

(<https://twitter.com/welaserproject>), que

reúne a 10 socios de 8 países europeos,

coordinados por **@CSIC**

(<https://twitter.com/CSIC>) **@CARobotica_**

(https://twitter.com/CARobotica_)

Aquí puedes ver toda la información 

welaser-project.eu (<https://t.co/6ftbVxVqFb>)

@LZH_Hannover

(https://twitter.com/LZH_Hannover) @ugent

(<https://twitter.com/ugent>) @unibo

(<https://twitter.com/Unibo>)

@uni_copenhagen

(https://twitter.com/uni_copenhagen)

@IETU4 @AGC_Robotics

(https://twitter.com/AGC_Robotics)

@jacobvdborne

(<https://twitter.com/jacobvdborne>)

[pic.twitter.com/BNJT11QFRL](https://twitter.com/BNJT11QFRL)

(<https://t.co/CapaDLcVWWh>)



AUG 2021 SUMMARY

Tweets	5	Tweet impres	2,889
Profile visits	1,030	Mentions	4
New followers	10		

Jul 2021 • 31 days

TWEET HIGHLIGHTS

Top Follower followed by 70 people

(<https://twitter.com/psdnepalngo>)



(<https://twitter.com/psdnepalngo>)

PSD-Nepal

(<https://twitter.com/psdnepalngo>)

FOLLOWS YOU
Progressive Sustainable Developers Nepal (PSD-Nepal) is a social organization established to work in the sectors like agriculture, health and environment

View profile (<https://twitter.com/psdnepalngo/>)

Top mention earned 12 engagements



(<https://twitter.com/BIOSCHAMP>)

BIOSCHAMP H2020 project

@BIOSCHAMP

(<https://twitter.com/BIOSCHAMP>) - Jul 6

(<https://twitter.com/BIOSCHAMP/status/1412297808162471939>)

 BIOSCHAMP aims to improve the

#MushroomSector

(<https://twitter.com/hashtag/MushroomSector?src=hash>) profitability while reducing the

need for **#pesticides**

(<https://twitter.com/hashtag/pesticides?src=hash>) by 90%.

EU There are other **#EUProjects**

(<https://twitter.com/hashtag/EUProjects?src=hash>) fighting pesticide use!

@welaserproject

(<https://twitter.com/welaserproject>)

@NOVATERRA19


(<https://twitter.com/NOVATERRA19>)

@novIGRain1

(<https://twitter.com/novIGRain1>)

@SprintH2020

(<https://twitter.com/SprintH2020>)

💡 Learn more about them 

bioschamp.eu/archivos/1177

(<https://t.co/G7RqQH5sB1>)

JUL 2021 SUMMARY

Tweet impressions	237	Profile visits	421
Mentions	3	New followers	-1

WE LASER COMMUNICATION RECORDING... (https://twitter.com/welaserproject)
Jun 2021 • 30 days

Sign up for Twitter Ads (https://ads.twitter.com/login?ref=gl-an-br-only&redirect_to_payments=true)

TWEET HIGHLIGHTS

JUN 2021 SUMMARY

Top Tweet earned 138 impressions

On 25/05/2021, the 2nd @welaserproject (https://twitter.com/welaserproject) Stakeholder Event (welaser-project.eu/events/ (https://t.co/roP5xqnDnz)) was held getting together over 40 participants. Attendees discussed the successful application of agricultural robots using laser techniques for weeding #innovation (https://twitter.com/hashtag/innovation?src=hash) @EU_H2020 (https://twitter.com/EU_H2020) pic.twitter.com/kaNiSTrHR8 (https://t.co/kaNiSTrHR8)



(https://twitter.com/welaserproject/status/1401838552118310018) (https://twitter.com/welaserproject/status/1401838552118310018)
 1 2

View all Tweet activity (/user/welaserproject/tweets)

View Tweet activity

Top mention earned 6 engagements

On 25/05/2021, the 2nd @welaserproject (https://twitter.com/welaserproject) Stakeholder Event (welaser-project.eu/events/ (https://t.co/roP5xqnDnz)) was held getting together over 40 participants. Attendees discussed the successful application of agricultural robots using laser techniques for weeding #innovation (https://twitter.com/hashtag/innovation?src=hash) @EU_H2020 (https://twitter.com/EU_H2020) pic.twitter.com/kaNiSTrHR8 (https://t.co/kaNiSTrHR8)



(https://twitter.com/welaserproject/status/1401838552118310018) (https://twitter.com/welaserproject/status/1401838552118310018)
 1 2

View all Tweet activity (/user/welaserproject/tweets)

View Tweet activity

May 2021 • 31 days

TWEET HIGHLIGHTS

MAY 2021 SUMMARY

Top Follower followed by 3 people

(https://twitter.com/0x616469747961)



(https://twitter.com/0x616469747961)

aditya

(https://twitter.com/0x616469747961)

(https://twitter.com/0x616469747961) FOLLOWS YOU
 View profile (https://twitter.com/0x616469747961/)

Top mention earned 22 engagements

(https://twitter.com/COAGInnova)

COAG INNOVA

@COAGInnova

(https://twitter.com/COAGInnova) - May 25

(https://twitter.com/COAGInnova/status/1397209209075343365)

Today we attend the 2nd @welaserproject

(https://twitter.com/welaserproject)

Stakeholder Event 🤖👥📺📱📺

A multiactor discussion is held on security and safety issues, and barriers and economic opportunities of the laser-based weeding system ↩

pic.twitter.com/NJ0sQmVfU2

(https://t.co/NJ0sQmVfU2)



Tweet impressions

123

Profile visits

175

Mentions

2

New followers

2

Apr 2021 • 30 days

TWEET HIGHLIGHTS

Top Tweet earned 189 impressions

Newsletter N. 1 of the [@welaser](https://twitter.com/welaser) (<https://twitter.com/welaser>)-project is released in English, German, Italian and Spanish. It's available on [welaser-project.eu/newsletter/](https://project.eu/newsletter/) (<https://t.co/r94s0ymybp>). [@EU_2020](https://twitter.com/eu_2020) (https://twitter.com/eu_2020) **#precisionfarming** (<https://twitter.com/hashtag/precisionfarming?src=hash>) **#Robotics** (<https://twitter.com/hashtag/Robotics?src=hash>) [pic.twitter.com/1xSkC3jdmw](https://t.co/1xSkC3jdmw) (<https://t.co/1xSkC3jdmw>)

Inside this issue:

Welcome to the first issue of the WeLASER newsletter.....2
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Communication and dissemination activities.....6



(<https://twitter.com/welaserproject/status/1379367148271902721>)
2

View all Tweet activity (/user/welaserproject/tweets)

View Tweet activity

Top Follower followed by 387 people

Mar 2021 • 31 days

TWEET HIGHLIGHTS

Top Follower followed by 387 people

(https://twitter.com/kriekc_josh)

(https://twitter.com/kriekc_josh)

Josh Kriekc

(https://twitter.com/kriekc_josh) **FOLLOWS YOU**

View profile (https://twitter.com/kriekc_josh/)

Top mention earned 83 engagements

[FIRA](https://twitter.com/FIRA_team) (https://twitter.com/FIRA_team)
FIRA

[@FIRA_team](https://twitter.com/FIRA_team) (https://twitter.com/FIRA_team)
Apr 10
(https://twitter.com/FIRA_team/status/1390815317249748996)
Killing weeds in a sustainable way using a autonomous robot with laser vision 🤖

[@welaserproject](https://twitter.com/welaserproject) (<https://twitter.com/welaserproject>)
[@InnoOrigins](https://twitter.com/InnoOrigins) (<https://twitter.com/InnoOrigins>)

innovationorigins.com/killing-weeds-...
(<https://t.co/EF83zhFq07>)

#robot (<https://twitter.com/hashtag/robot?src=hash>) **#agriculture** (<https://twitter.com/hashtag/agriculture?src=hash>) **#agtech** (<https://twitter.com/hashtag/agtech?src=hash>) **#weeding** (<https://twitter.com/hashtag/weeding?src=hash>) [pic.twitter.com/NUR20PHdSG](https://t.co/NUR20PHdSG) (<https://t.co/NUR20PHdSG>)



APR 2021 SUMMARY

Tweets	2	Tweet impres	505
Profile visits	579	Mentions	4
New followers	10		

MAR 2021 SUMMARY

Tweet impressions	100	Profile visits	176
Mentions	2	New followers	2

Top mention earned 4 engagements

(https://twitter.com/LZH_Hannover)
LaserZentrumHannover
[@LZH_Hannover](https://twitter.com/LZH_Hannover)
(https://twitter.com/LZH_Hannover) · Mar 25
(https://twitter.com/LZH_Hannover/status/1375050733532426241)
Im [@welaserproject](https://twitter.com/welaserproject) (<https://twitter.com/welaserproject>) arbeiten wir mit 9 Partnern daran, **#Laser** (<https://twitter.com/hashtag/Laser?src=hash>) mit **#KI** (<https://twitter.com/hashtag/KI?src=hash>) und **#IoT** (<https://twitter.com/hashtag/IoT?src=hash>) zu kombinieren, als Alternative zur chemischen Unkrautbekämpfung. Testen werden wir den Prototyp im Ackerbau.
#Laserjäten
(<https://twitter.com/hashtag/Laserj%C3%A4ten?src=hash>) [@EU_H2020](https://twitter.com/EU_H2020) (https://twitter.com/EU_H2020) **#H2020** (<https://twitter.com/hashtag/H2020?src=hash>) **#Cloud** (<https://twitter.com/hashtag/Cloud?src=hash>) **#Nachhaltigkeit** (<https://twitter.com/hashtag/Nachhaltigkeit?src=hash>) [pic.twitter.com/Zc528W7JPr](https://t.co/Zc528W7JPr) (<https://t.co/Zc528W7JPr>)



Feb 2021 • 28 days

TWEET HIGHLIGHTS

Top Follower followed by 1,455 people
(<https://twitter.com/RoboCity2030>)

Top mention earned 1 engagements
(<https://twitter.com/DigitalAgriUCO>)
Máster DIGITAL AGRI

FEB 2021 SUMMARY

Tweet impressions
128

Profile visits
44

Jan 2021 • 31 days

TWEET HIGHLIGHTS

Top Follower followed by 1,745 people
(<https://twitter.com/DigitalAgriUCO>)



(<https://twitter.com/DigitalAgriUCO>)

Máster DIGITAL AGRI

(<https://twitter.com/DigitalAgriUCO>)

Un proyecto coordinado por el @CSIC (<https://twitter.com/CSIC>) desarrolla un #robot autónomo que utilizará el #láser y la inteligencia artificial para eliminar las #malashierbas de los cultivos de forma sostenible

View profile (<https://twitter.com/DigitalAgriUCO/>)

Top mention earned 34 engagements



(<https://twitter.com/DigitalAgriFood>)
Digital AgriFood

@DigitalAgriFood
(<https://twitter.com/DigitalAgriFood>) - Jan 27
(<https://twitter.com/DigitalAgriFood/status/1354371319450624004>)

Un proyecto coordinado por el @CSIC (<https://twitter.com/CSIC>) desarrolla un #robot

(<https://twitter.com/hashtag/robot?src=hash>)

autónomo que utilizará el #láser

(<https://twitter.com/hashtag/l%C3%A1ser?src=hash>) y la inteligencia artificial para

eliminar las #malashierbas

(<https://twitter.com/hashtag/malashierbas?src=hash>) de los cultivos de forma

sostenible

🔄

JAN 2021 SUMMARY

Tweet impressions
89

Profile visits
57

Mentions
3

New followers
2

Dec 2020 • 31 days

TWEET HIGHLIGHTS

Top Follower followed by 916 people
(<https://twitter.com/custolopez>)



(<https://twitter.com/custolopez>)

Custodio López Cruz

(<https://twitter.com/custolopez>)
Agricultura Sostenible. En el campo tengo mis raíces.

View profile (<https://twitter.com/custolopez/>)

Top mention earned 91 engagements



(<https://twitter.com/alvaroareta>)
Alvaro Areta

@alvaroareta (<https://twitter.com/alvaroareta>) - Dec 1
(<https://twitter.com/alvaroareta/status/1333672465252413441>)

Nace @welaserproject

(<https://twitter.com/welaserproject>), la solución tecnológica que pretende acabar con los tratamientos químicos en la eliminación de malas hierbas.

👤 Agricultores y 7 centros de I+D juntos para contribuir desde la ciencia a un sector agrario más sostenible #innovación
(<https://twitter.com/hashtag/innovaci%C3%B3n?src=hash>)

DEC 2020 SUMMARY

Tweet impressions
216

Profile visits
195

Mentions
4

New followers
3

Nov 2020 • 30 days

TWEET HIGHLIGHTS

Top Tweet earned 192 impressions

On 26/11/2020, the 1st @welaserproject (<https://twitter.com/welaserproject>) Stakeholder Event was held getting together over 60 participants -partners, REA officers, farmers, institutions, NGOs, and policymakers. The event conclusions will drive the development of the laser-based weeding system #innovation
(<https://twitter.com/hashtag/innovation?src=hash>) @EU_H2020
(https://twitter.com/EU_H2020)
(<https://twitter.com/Nr58eAa2a0>)

Top mention earned 127 engagements



(https://twitter.com/La_COAG)
COAG

@La_COAG (https://twitter.com/La_COAG) - Nov 26
(https://twitter.com/La_COAG/status/1331894157791649792)

#EstáPasando

(<https://twitter.com/hashtag/Est%C3%A1Pasando?src=hash>) Nuestro responsable de

jóvenes @marcosgarceslz

(<https://twitter.com/marcosgarceslz>)

siguiendo de forma online la presentación

del proyecto de innovación

🔄

NOV 2020 SUMMARY

Tweets
1

Tweet impres
425

Profile visits
129

Mentions
9

New followers
12

Oct 2020 • 31 days

TWEET HIGHLIGHTS

Top Tweet earned 292 impressions

On October 1st, 2020, [@welaserproject](https://twitter.com/welaserproject) (<https://twitter.com/welaserproject>), an innovation action funded by [@EU_H2020](https://twitter.com/EU_H2020) (https://twitter.com/EU_H2020), started its activities for weeding with laser technologies and contributing to the eradication of herbicides. The kickoff meeting was held on October 13th [#precisionfarming](https://twitter.com/hashtag/precisionfarming?src=hash) (<https://twitter.com/hashtag/precisionfarming?src=hash>) [#Robotics](https://twitter.com/hashtag/Robotics?src=hash) (<https://twitter.com/hashtag/Robotics?src=hash>) [pic.twitter.com/VlwOTMDFWI](https://twitter.com/hashtag/Robotics?src=hash) (<https://t.co/VlwOTMDFWI>)



(<https://twitter.com/welaserproject/status/1321789670127636485>) <https://twitter.com/welaserproject/status/1321789670127636485>

4 2

View all Tweet activity (/user/welaserproject/tweets)

View Tweet activity

Top mention earned 18 engagements

On October 1st, 2020, [@welaserproject](https://twitter.com/welaserproject) (<https://twitter.com/welaserproject>), an innovation action funded by [@EU_H2020](https://twitter.com/EU_H2020) (https://twitter.com/EU_H2020), started its activities for weeding with laser technologies and contributing to the eradication of herbicides. The kickoff meeting was held on October 13th [#precisionfarming](https://twitter.com/hashtag/precisionfarming?src=hash) (<https://twitter.com/hashtag/precisionfarming?src=hash>) [#Robotics](https://twitter.com/hashtag/Robotics?src=hash) (<https://twitter.com/hashtag/Robotics?src=hash>) [pic.twitter.com/VlwOTMDFWI](https://twitter.com/hashtag/Robotics?src=hash) (<https://t.co/VlwOTMDFWI>)



(<https://twitter.com/welaserproject/status/1321789670127636485>) <https://twitter.com/welaserproject/status/1321789670127636485>

4 2

View all Tweet activity (/user/welaserproject/tweets)

View Tweet activity

OCT 2020 SUMMARY

Tweets	1	Tweet impres	294
Profile visits	32	Mentions	2
New followers	3		

Sep 2020 • 30 days

TWEET HIGHLIGHTS

Top Follower followed by 2,518 people

(<https://twitter.com/alvaroareta>)

(<https://twitter.com/alvaroareta>)

Alvaro Areta

(<https://twitter.com/alvaroareta>) <https://twitter.com/alvaroareta> [FOLLOWS YOU](#)
Dr. Ingeniero Agrónomo. Técnico en la Coordinadora de Organizaciones de Agricultores y Ganaderos (COAG)

View profile (<https://twitter.com/alvaroareta/>)

Top mention earned 2 engagements

(<https://twitter.com/CoopsAgroES>)
Cooperativas Agro-alimentarias de España

@CoopsAgroES (<https://twitter.com/CoopsAgroES>) · Sep 30
(<https://twitter.com/CoopsAgroES/status/1311238084089049091>)

[@REA_research](https://twitter.com/REA_research) (https://twitter.com/REA_research)
[@EU_H2020](https://twitter.com/EU_H2020) (https://twitter.com/EU_H2020)
[@EUAgri](https://twitter.com/EUAgri) (<https://twitter.com/EUAgri>)
[@EU_MARE](https://twitter.com/EU_MARE) (https://twitter.com/EU_MARE)
[@EU_ENV](https://twitter.com/EU_ENV) (https://twitter.com/EU_ENV)
[@welaserproject](https://twitter.com/welaserproject) (<https://twitter.com/welaserproject>)
[@ProhensJaime](https://twitter.com/ProhensJaime) (<https://twitter.com/ProhensJaime>) Y
[@CoopsAgroES](https://twitter.com/CoopsAgroES) (<https://twitter.com/CoopsAgroES>) participa en dos proyectos [#COOPID](https://twitter.com/hashtag/COOPID?src=hash) (<https://twitter.com/hashtag/COOPID?src=hash>) y [#MEF4CAP](https://twitter.com/hashtag/MEF4CAP?src=hash) (<https://twitter.com/hashtag/MEF4CAP?src=hash>) [@jncorb](https://twitter.com/jncorb) (<https://twitter.com/jncorb>)

1

View Tweet

(<https://twitter.com/CoopsAgroES/status/1311238084089049091>)

SEP 2020 SUMMARY

Tweet impressions	5	Profile visits	8
Mentions	1	New followers	2

8.2.4. Facebook

Publicaciones Facebook



Welaser-project
Publicado por Rubén Villanueva · 21 de septiembre a las 08:34 ·

Stakeholders are really important in @welaserproject. This #PracticeAbstract is an example of their contribution: "Stakeholders help defining the WeLASER system specifications" !! Download it here <https://welaser-project.eu/download/welaser-pa-2-english/>

Ver traducción

WeLASER Practice Abstract N. 2
Eco-innovative weeding with laser

Stakeholders help defining the WeLASER system specifications

Opportunities
The first WeLASER Stakeholder Event was held on 26/11/2020 gathering over 20 participants including farmers, research and agriculture institutions, civil society NGOs, policymakers, the REA project officers and the project partners. The event was an opportunity to involve the stakeholders in the project and in the definition of the system characteristics.

Preliminary system characteristics

Rendimiento de tu publicación		
402	Personas alcanzadas	
9	Me gusta, comentarios y contenido compartido	
9	Clics en publicaciones	
3	0	6
Visualizaciones de fotos	Clics en el enlace	Clics de otro tipo
Ver más detalles		
COMENTARIOS NEGATIVOS		
0	Ocultar todas las publicaciones	
0	Ocultar publicación	
0	Reportar como spam	
0	Ya no me gusta esta página	
9	Me gusta, comentarios y contenido compartido	
DISTRIBUCIÓN DE CONTENIDO DE MARCA Ver desglose		
402	402	0
Alcance total	Alcance orgánico	Alcance pagado
32	32	0
Impresiones totales	Impresiones orgánicas	Impresiones pagadas

Welaser-project
Publicado por Pablo Gonzalez · 28 de noviembre de 2020 ·

On November 26th, @welaserproject held the First WeLASER Stakeholder Event getting together in a virtual meeting the project partners, the REA project officers, and many farming industries, practitioners, agricultural institutions, research institutions, civil societies (NGO), and policymakers. The event conclusions will drive the WeLASER consortium in improving the laser-based weeding system under development.

Ver traducción

WeLASER
Eco-innovative weeding with laser

First Stakeholder Event

Rendimiento de tu publicación		
21	Personas alcanzadas	
2	Me gusta, comentarios y contenido compartido	
3	Clics en publicaciones	
1	0	2
Visualizaciones de fotos	Clics en el enlace	Clics de otro tipo
Ver más detalles		
COMENTARIOS NEGATIVOS		
0	Ocultar todas las publicaciones	
0	Ocultar publicación	
0	Reportar como spam	
0	Ya no me gusta esta página	
2	Me gusta, comentarios y contenido compartido	
DISTRIBUCIÓN DE CONTENIDO DE MARCA Ver desglose		
21	21	0
Alcance total	Alcance orgánico	Alcance pagado
32	32	0
Impresiones totales	Impresiones orgánicas	Impresiones pagadas

Welaser-project
Publicado por Rubén Villanueva · 9 de septiembre a las 14:29 ·

#WeLASER already published 12 #PracticeAbstracts! Curious about them? Read more here <https://welaser-project.eu/practice-abstracts/>

Ver traducción

WeLASER Practice Abstract N. 1
Eco-innovative weeding with laser

Laser weeding in organic production

weeding vs. mechanical weeding
Weeding with a laser makes good sense in organic production because laser-weeding is based on electricity produced from windmills, hydropower or other non-fossil fuels and thereby contributed to an environmentally friendly production. The laser beam is only directed against the growth point of the small emerging weed plants, which is a very small spot between the first leaves. Therefore, laser weeding interferes as little as possible with the environment in contrast to mechanical weed control, which so harms beneficial organisms the soil and on the soil surface. Mechanical weed control also

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Welaser-project
Publicado por Pablo Gonzalez · 10 de noviembre de 2020 ·

WeLASER project kickoff meeting was held on October 13th, 2020.

Ver traducción

Sustainable Weed Management in Agriculture with Laser-Based Autonomous Tools

WeLASER
Eco-innovative weeding with laser

CSIC, FUTUREONICS, LZH, UNIVERSITY OF KÖLN, IETU, UNIVERSITY OF AMSTERDAM, BIOECONOMY, COAG, REA

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Newsletter N. 1 of the @welaser-project is released in English, German, Italian and Spanish. It's available on <https://welaser-project.eu/newsletter/>.

Ver traducción

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8.2.5. LinkedIn

