Communication Report (D7.4.1, M12)

1st Year Progress

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DATE: 9/5/2018

VERSION: 1

CLASSIFICATION: PU | Public

This research was carried out by Wageningen UR Greenhouse Horticulture and supported by the Dutch Ministry of Agriculture, Nature and Food Quality.

PROJECT ACRONYM: AGRINUPES

PROJECT TITLE: Integrated monitoring and control of water, nutrients and plant protection products towards a sustainable agricultural sector

EU FUNDING: ERA-NET Cofund WaterWorks2015

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Table of contents

List of abbreviations

AGRINUPES	Integrated monitoring and control of water, nutrients and plant protection products towards a sustainable agricultural sector
UNG(s)	User Network Group(s)
BMP	Best Management Practices

List of tables

Summary

This report describes the planning of external dissemination actions for the AgriNuPes project. It further gives the status and progress after the first year (M12).

One of the general objectives of AgriNuPes is to undertake demonstration and communication activities in all case areas, including the exchange of experiences of good practices among partners and stakeholders of the sensors developed within the project. External communication will focus on the exchange of information between the partners and the end-users and a wider public. This is done by informing end-users about the results of the project by organising User Network Group (UNG) meetings and demonstrating research, other results and best practices to a wide audience beyond the UNG on a national level by organising “Info Days/Seminars” at the research facilities and case areas. Public results of the project will be disseminated by factsheets and articles in magazines and journals to the end-users and a wider public. To the scientific community dissemination through contribution to international conferences and through publications in scientific journals

In the first year the dissemination plan was made. According to this plan nearly all actions have been achieved. A press release was issued at the beginning of the project. The project website was launched as well as partner websites from INESTEC, WUR, RISE, SUEN, and RITEC. Newsletters were issued in 2 case study areas: Portugal and the Netherlands. In the Netherlands the first UNG was already started. The conclusion of midterm project report was made available.

In conclusion, the dissemination activities are on schedule. Not all planned actions were achieved, but this is due to the fact that the project did not yet (as planned) has tangible results yet. The sensor prototypes are planned to become available at M18, which is the moment to engage with the end-users in the UNGs. The next step in the dissemination plan is to inform potential end-users about the first year results, and building the UNGs in the remaining 4 case study areas. Information to support this information is already available in the form of the draft factsheets and the midterm report.

1. Introduction

The Work Package 7 (WP7) coordinated by WUR involves three tasks: Demonstration (T7.1), Dissemination (T7.2) and Communication (T7.3). While Demonstration is expected to start from month 18 on (once working prototypes of sensors have become available), the other two tasks run during the whole project execution (M1-M36). External communication task (T7.3) focusses on coordination of all external communication activities. It doesn't organise the actual activities itself, but it plans and maintains an overview of all activities in order to streamline them. This report describes the first year progress of the task on external communication, which work is coordinated by INESC TEC.

To maximise the promotion of the project and its findings, AgriNuPes exploits distinct measures. It focusses on organising User Network Group meetings (UNG) and seminars and making fact sheets, newsletters, reports, scientific and other publications available to dedicated stakeholder groups, policy and a wide public by using the website, social media and other means. These measures are tailored to the needs of various audiences, including groups beyond the project's own community. Measures assure a balanced technical and public/societal engagement on all issues. The language used in all communications is English, but in case communication is only within a specific country the local language will be used.

In all partners case areas, bi-annual UNG meetings will be organised for targeted stakeholder consultation to inform about the progress and to get feedback from the end-users and potential resellers for the developed sensors and tools. At least once for every case study, an info-day or seminar will be organised locally at the demonstration site for end-user feedback and dissemination and exploitation purposes of demonstration results. The minutes of these meetings will be shared among all partners. These info-days are open to a wide public as for instance for growers, extension workers and technical suppliers, during which they can visit the demo-facilities and attend workshops.

2. Communication Activities

2.1. Communication Activities

The AgriNuPes general objective is to undertake demonstration and communication activities in all case areas, including the exchange of experiences of good practices among partners and stakeholders. The specific objectives are:

Demonstrate: To inform end-users about the results of the project by organising UNG meetings and demonstrating research, other results and best practices to a wide audience beyond the UNG on a national level (per partner) by organising "Info Days/Seminars" at the research facilities and case areas;

Disseminate: Public results of the project will be disseminated by factsheets and articles in magazines and journals to the end-users and a wider public. To the scientific community dissemination through contribution to international conferences (1 per partner) and through publications in scientific journals (2-3 combined for partners per topic);

Communicate: To exchange information between the partners and the end-users and a wider public (External Communication).

2.2. Communication Channels

The following communication channels will be used:

User Network Group (UNG) meetings: All case areas partners will organise on bi-annual scale stakeholder consultation meetings to inform UNG upon the progress and to get feedback from the end-users. Minutes of the meetings (as well in English) will be shared among all partners.

Info-days or Seminars: local (open) general meetings are organised for end-user feedback and dissemination (and exploitation) of demonstration results (preferably every year, but at least) once at every case study. These local seminars are for growers, extension workers and technical suppliers. Under guidance of the case study leader, users will be invited to visit the demo-facilities and attend workshops.

Website: it will be opened, hosted and maintained by INESC TEC, who will maintain a restricted part (WP1) to serve as a data and information interchange platform for the Consortium. Public data (eg. Factsheets, BMPs, open access scientific articles) will be available to the wider public

through a non-restricted part (external communication). The website will serve as the central gate to make public information available to a global audience, incorporating lists of public dissemination material and deliverables and links to partner websites.

Events: Partners will contribute to scientific conferences, seminars, fairs, and workshops.

Publications: Partners will disseminate results through articles (papers) in magazines and scientific journals.

2.3. Communication Means

The following communication means will be used:

Press Releases: To inform a wide group of people, a press release about upcoming events (annual seminars) and achieved milestones will be issued on a national scale by all involved partners.

Newsletters: general information will be spread in a newsletter 2 times per year per case area as progress is achieved in demonstrations. They will be distributed by available channels from other networks such as growers associations and technology platforms in local case. SUEN will distribute annually a project newsletter (English), containing information from demonstrations to be able to inform multiple regions about local results. For this, SUEN will copy national press releases and newsletters and use communication channels from partners and other associations all enclosed in an e-mail address list maintained by SUEN. We target as well European wide groups such as EIP Water, EIP Agri and Action Groups (f.i. WIRE).

Factsheets: will show the expected result, novel techniques, data and benefit for the users, expected costs and Best Management Practices (BMP) developed in WP3. WUR will develop a uniform format for the several engineering groups (EGE, INESC, TEC). RISE will check whether proposed technologies are in conformity with existing standards. For policy makers, impact of use and consequences for legislative measures will be shown (SUEN). Draft versions will be made available at the beginning of the project, which will be updated in time, according to new insights and feedback from stakeholders.

Publications: Partners will collaboratively write two scientific papers about the nutrient and PPP-sensor. Each scientific partner will visit at least 1 symposium, give a presentation[1] and write

[1] The process of presenting at symposia will be coordinated so that unique and consistent data are presented for each symposium.

a conference paper. All partners will write magazine articles or produce trade press articles at least 1 per year.

Reports: A larger number of reports mentioned in the project plan. A large number of them are confidential and only to be used among consortium members. The public ones will be dealt with within the communication plan (see Appendix 1: List of public reports).

2.4. Targeted Audience

The targeted audiences are:

End-users: These are the growers, advisory services and water authorities using the monitoring equipment, sensors and tools. They want to use the sensors in order to either enhance their production or quality of the crop, to minimize their use of inputs (water, nutrients, PPPs) or to be able to comply with existing legislation. They can be reached for instance through the User Network Groups, or other networks.

Suppliers: These are potential resellers of the sensors and tools to be developed. They want to know how sensors/tools work, can be applied and to which markets they could be sold.

National or European (financing) bodies: These are in general policy based bodies that are interested to know that new monitoring technologies become available that can support the goals for legislation (emission reduction).

Scientific community: All bodies dealing with research and education in the field of monitoring and control for agriculture and water related issues. These will be mostly interested to know how sensors work and can be applied also in other (newer) applications.

Public Audience: These are all other stakeholders interested in any way in sensors and tools for agricultural practices.

2.5. Exploitable Results

Exploitable results are the items which we intend to perform external communication about. The main exploitable results identified for this project are:

- NPK optical sensor (INESC TEC).
- Biosensor for insecticides being imidacloprid (a neonicotonoid) and pirimicarb (a carbamate) (EGE).

- Fertigation controller with possibility of integrating NPK optical sensor (RITEC).
- Control algorithm (software) / Embedded control algorithm (hardware) (INESC TEC).
- Best Management Practices (all partners).

2.6. Communication Plan

In order to make external communication effective, all actions are planned according to the foreseen progress in the project serving a well-planned purpose. For all actions the following check-list is used:

- What is the purpose?
- What information is needed?
- Who checks the information? Deadlines?
- What conditions must be met?
- What is the best time to share it publically?
- Who will do the follow-up?
- What other things/persons do we need for it?
- What are the costs, and are these available?

The following overall plan is made (M12). Main external communications actions are lined-up around the annual milestones (M12, M24, M36).

Table 1. Communication Plan (1st version, M12).

Month	Action	Who	Output	Done
M3	PRESS-RELEASE about start of project	INESC TEC	Press release	√
M3	Website available for AGRINUPES (www.agrinupes.eu)	INESC TEC	website	√
M6	Partner websites available	All partners	website	INESTEC, WUR, RISE, SUEN, RITEC
M6	NEWSLETTERS about AGRINUPES objectives in all case areas	All partners	news	NL, PT,SE
M8	Organising first UNG-meeting (building the UNG)	INESCTEC, FCUP, SUEN, JTI, WUR	UNG	NL
M12	**Conclusion of midterm project report**	**INESC TEC**	**Milestone**	√
M13	Newsletters on websites, public deliverables available	INESC TEC	news, website, reports	
M14	Communicate with UNG the draft factsheets and BMP and get feedback for the design process	INESCTEC, FCUP, SUEN, JTI, WUR	Factsheets, BMP	
M23	2nd UNG-meeting and demonstration of first prototypes	INESCTEC, FCUP, SUEN, JTI, WUR	UNG	
M24	**Conclusion of midterm project report**	**INESC TEC (+all)**	**Milestone**	
M25	Newsletters on websites, public deliverables available	INESC TEC (+all)	news, website, reports, press release	
M34	Conclusion of draft final project report	INESC TEC	reports	
M35	3rd UNG-meeting and demonstration of final prototypes	INESCTEC, FCUP, SUEN, JTI, WUR	UNG, reports	
M36	**Conclusion of final project report**	**INESC TEC**	**Milestone**	
M36	Newsletters on websites, public deliverables available, press release	INESC TEC (+all)	news, website, reports, press release	

3. Progress (M1-M12)

User Network Groups:

- Dutch UNG established (M7, see Appendix 3).

User Network Group (UNG) meetings:

- UNG meeting at the "Annual WATER-day" in Bleiswijk (NL), Oct 5th, 2017 (M7). Stakeholder consultation meeting to inform about the progress and to get feedback from the end-users. Presentation "AGRINuPeS: Sensoren voor meststoffen en gewasbeschermingsmiddelen" available at ww.glastuinbouwwaterproof.nl/onderzoeken/bo_20_003_059_agrinupes_sensoren_voor_meststoffen_en_gewasbeschermingsmiddelen/

Info-days, Seminars, workshops:

None reported.

Websites:

- The restricted portal is operational (M1, INESCTEC, www.agrinupes.eu).
- AgriNupes page at the Water JPI website (M1, INESCTEC, www.waterjpi.eu/index.php?option=com_content&view=article&id=545:agrisensus&catid=156:joint-calls).
- The public website online (M3, INESCTEC).
- Dutch website at WUR online (M3, WUR, https://www.wur.nl/en/newsarticle/Integrated-monitoring-and-control-of-water-nutrients-and-plant-protection-products-towards-a-sustainable-agricultural-sector.htm).
- Turkish website at SUEN online (https://suen.gov.tr/faaliyetlerimiz/projeler/).
- Swedish website at RISE online (https://www.sp.se/sv/units/risebiovet/fb/forskning/euprojekt/Sidor/default.aspx).
- Spanish website at Ritec online (http://www.ritec.es/sistemas-riego-fertirrigacion/proyectos-de-investigacion.html)

Events:

- Poster presentation in Agri Innovation Summit 2017.

Publications:

- AGRINUPES in the EIP Water Conference 2017: WIRE brochure (M6, WUR, see Appendix 3).
- Miguel G. Santos, Isabella Rocon, Ruth Pereira, Susana Carvalho, 2017. Caracterizaçao de sistemas de produçao, gesta da fertirrega e aplicaçao de produtos fitofarmaceuticos em culturas sem solo em portugal: primeiros passos. In Congresso Luso-Brasileiro de horticultura (CLBHORT2017). Lisboa, Portugal, 1-4 Novembro 2017.

Press Releases:

Press Release (M3, INESCTEC): Several news items were issued in Portugal for AgriNuPes (at that time called AgriSensus) during the period 19-12-2016 until 7-1-2017.

- Portuguese news at UP online (https://noticias.up.pt/inesc-tec-e-fcup-querem-maior-eficiencia-no-uso-de-agua-na-agricultura/, 19-12-2016)
- Portuguese news at REDE INOVAR (http://pt.skanplatform.org/posts/1760 , 22-12-2016)
- Portuguese news item at public news site (https://www.publico.pt/2017/01/05/tecnologia/noticia/sensores-portugueses-poupam-agua-na-producao-agricola-1757229, 5-1-2017)
- Portuguese news item at agronegocios.eu (http://www.agronegocios.eu/noticias/novos-sensores-permitem-aumentar-eficiencia-do-uso-da-agua-na-producao-agricola/, 7-1-2017)

Newsletters:

- News item “AGRINUPES – Sensoren voor nutriënten en gewasbeschermingsmiddelen” on website (M3, WUR, www.wur.nl/nl/nieuws/AGRINUPES-Sensoren-voor-nutrienten-en-gewas-beschermingsmiddelen.htm).
- News letter “Europees project ontwikkelt nieuwe sensoren voor nutriënten en gewasbeschermingsmiddelen” to local Dutch Network (29-7-2018, M5, LTO-Groeiservice, www.glastuinbouwwaterproof.nl/nieuws/europees-project-ontwikkelt-nieuwe-sensoren-voor-nutrienten-en-gewasbeschermingsmiddelen/)
- News item “Sensoren voor meststoffen en gewasbeschermingsmiddelen”, on website: www.glastuinbouwwaterproof.nl/nieuws/sensoren-voor-meststoffen-en-gewasbeschermingsmiddelen/ (27-12-2017, M9, LTO-groeiservice, Harry Stijger)

- Notification at Dutch funding organisation RVO (https://www.rvo.nl/era-net-waterworks)
- https://hortinext.nl/sensoren-voor-meststoffen-en-gewasbeschermingsmiddelen/ (Hortinext, 19-3-2018)
- Turkish website from EGE online at Research Gate Net (https://www.researchgate.net/project/AGRINuPeS-INTEGRATED-MONITORING-AND-CONTROL-OF-WATER-NUTRIENTS-AND-PLANT-PROTECTION-PRODUCTS-TOWARDS-A-SUSTAINABLE-AGRICULTURAL-SECTOR).
- News in Swedish magazine for horticultural growers called "Viola", **Nya sensorer för kontroll av vattenkvalitet (AgriNuPes)**

Factsheets:

- Template for Factsheets and BMP available (M4, WUR).
- Draft Factsheets and BMP available (M11, WUR).

National Reports:

- Dutch annual project report (BO-20-003-059, M10, WUR, In Dutch).

4. Appendix

Appendix 1 – List of (Planned) Public Reports

D5.1. Report on general characterization of the 'CRUs' (M3, FCUP, **available**)

D3.1. Report on sensor requirements (M12, WUR, **available**)

D7.1.1. Demonstration Report, containing collected minutes of UNG Meetings and Demonstration reports, and all dissemination activities (M12, WUR, **available**).

D7.2.1. Dissemination Report containing 2 Factsheets including BMP on the nutrient and PPP-sensors and its application and magazine articles (all partners) (M12, WUR, **restricted**)

D7.4.1. Communication Report (M12, INESC TEC, **available**)

D2.6. Applicability testing and evaluation of biosensors via research field (D, M15-M18, EGE)

D5.2. Report on suitability and impacts of 'CRUs' on irrigation water, soil and plant level (M24, FCUP)

D6.2. EU legislation SWOT analysis report (M24, SUEN)

D7.1.2. Demonstration Report, containing collected minutes of UNG Meetings and Demonstration reports, and all dissemination activities (M24, WUR).

D7.2.2. Dissemination Report containing 2 Factsheets including BMP on the nutrient and PPP-sensors and its application and magazine articles (all partners) (M24, WUR)

D7.4.2. Communication Report (M24, INESC TEC)

D3.2. Test report for laboratory experiments (M36, JTI)

D3.3. Evaluation Report for semi-practical scale (M36, WUR)

D3.4. Report on Best Management Practices (M36, WUR)

D5.3. Report on the performance of both sensors in a 'CRUs' and guidelines for BMP (M36, FCUP)

D6.3. Policy guideline report for the utilization of AGRINUPES (M36, SUEN)

D7.1.3. Demonstration Report, containing collected minutes of UNG Meetings and Demonstration reports, and all dissemination activities (M36, WUR).

D7.2.3. Dissemination Report containing 2 Factsheets including BMP on the nutrient and PPP-sensors and its application and magazine articles (all partners) (M36, WUR)

D7.4.3. Communication Report (M36, INESC TEC)

D7.3. Two Scientific papers (O, M36, EGE, INESC TEC)

Appendix 2. Copies of dissemination documents

WIRE brochure

AGRINUPES: MONITORING AND CONTROL OF WATER, NUTRIENTS AND PESTICIDES

Promoter	*Institute for Systems and Computer Engineering, Technology and Science (INESC TEC)*
Period	*Since 2017 (until 2020)*
Location	*Europe (Portugal, Spain, Turkey, Sweden, The Netherlands)*
Objective	*Development of an effective integrated and sustainable monitoring and control system with innovative ion selective sensors for nutrients and bio-based sensing of pesticides for optimal water and nutrient supply and reuse, minimizing the effects on the environment.*
Target Audience	*Farmers, Technicians, Policy/Decision Makers, Scientist/Researchers.*
Level	*International (Europe), National, Regional*
Accessibility	*Open days organised during 2018-2019 at several demo-sites in Porto (P), Murcia (ES), Konya (TR), Bleiswijk (NL). Contribution to Network User Groups.*
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Project description

For optimizing plants needs while minimizing the environmental impacts, sustainability and competitiveness of European agriculture are intrinsically related to the efficient use of water, fertilizers and plant protection products (PPP). Good Agricultural Practices - in the context of circular economy- force growers to minimize their wastewater and thus optimize the use of nitrogen and phosphorus based fertilizers and PPPs. Better management requires reliable decision-support systems (DSS) based on water quality feedback making use of cost-effective, robust, low-maintenance and accurate sensors for nutrients and pesticides. So far, available sensor technology does not meet the challenges for on-site monitoring. The project intends to develop such sensors and integrate them into fertigation equipment, with demonstration of their use for practical management purpose at several European demo-sites.

Results obtained so far

- R&D of an integrated and sustainable monitoring system with innovative ion selective sensors for nutrients (NPK) and bio-based sensing of pesticides (IMIDACLOPRID and PIRIMICARB); to be used for optimal water and nutrient supply and reuse, minimizing the effects on the environment (prototypes expected 2017-2018).
- An easy-to-use, robust and fault-tolerant fertigation controller, to meet both crop needs and grower yield/costs expectations (prototype expected 2017-2018).
- Validation and demonstration the applicability of developed technologies at four sites covering several types of crop production systems (recycled or cascaded water system) from greenhouses to open-field agriculture in various climatic regions (expected 2019-2020).
- Monitoring and Control Products available for the market (expected 2020 ...).

Success factors

The project builds on the extensive experience, competence and early work conducted on optical fibre-based sensors, biosensors, water policy models, plant nutrition, smart irrigation scheduling and robust control. It is implemented by a trans-disciplinary team of experts. The demonstration sites will be open during 2018-2020 for visiting. Farmers, suppliers, scientists, water boards and policy makers are welcome to visit these demo-sites at open days. Relevant stakeholders may join the regional Network User Groups set-up around the demo-sites in order to be informed during the research and development phase of the technologies. Their input is valuable for the project in order to tune the systems to the end-user needs.

Performance indicators

As a result of applying the AGRINUPES sensors, a significant increase of water and fertilizer use efficiency is obtained in agricultural/horticultural field applications (expected < 50%), a longer and economic reuse cycle for the drainage water is achieved, and the pollution of surface and ground waters by fertilizers and PPP is prevented or significantly reduced. The new sensors will lead to worldwide new markets for the European water technology sector, thus strengthening the competitiveness and growth of SMEs and related companies.

Repeatability & Applicability

With the sensors, growers will have information about the input and output water quality, and can evidence-based decide on how and when to irrigate and fertigate, and on whether the costly task of cleaning is advisable before disposal. Governmental organizations (water authorities) may use sensors for checking water quality (pesticides) in ground and surface waters. Technology suppliers (re-sellers of equipment for agricultural practices) can acquire a license to sell the sensors and decision support systems world-wide.

Further references

The project "Integrated monitoring and control of water, nutrients and plant protection products towards a sustainable agricultural sector" is funded by: ERA-NET / Co-fund WaterWorks2015.

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Appendix 3: User Network Groups

User Network Group (NL)
Established (M6) and 1 UNG meeting held.

User Network Group (PT)
Not formed yet.

User Network Group (ES)
Not formed yet.

User Network Group (TR)
Not formed yet.

User Network Group (S)
Not formed yet.