Nutrient Management and Nutrient Recovery Thematic Network

Summary of the NUTRIMAN Nitrogen and Phosphorus Thematic network project and measurable results.

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NUTRIMAN in Brief



- **Title: Nutrie**nt **Man**agement and Nutrient Recovery Thematic Network **(NUTRIMAN) from year 2018 to 2031**
- **Programme:** H2020, RUR 15, **Thematic networks compiling knowledge ready for practice = CSA Coordination and Support Actions (not RIA)**
- **Coordinator:** Edward Someus, 3R-BioPhosphate Ltd.
- **Start of the project: 1 October 2018, Duration: 36 months + 10 years**
- **Int. conference: September 16, 2021 https://nutriman.net/conference**
- **Funded by:** European Union Horizon 2020, RUR-15-2018 (CSA Coordination and Support Action), grant agreement no. 818470.
- **Official website: https://www.nutriman.net**

The NUTRIMAN Consortium

Total: 18 Partners from **8 EU** countries 2018-2021:

- **9 Research Institutes**
- **3 SMEs**
- **Chambers of Agri, Farmers' association,**
- **Non-profit organisation.**

www.nutriman.net

The NUTRIMAN project

What is NUTRIMAN?

- A **Nitrogen and Phosphorus thematic network compiling and sharing knowledge of "ready-for-practice"** recovered bio-based fertiliser technologies, products, applications and practices for the benefit of agricultural practitioners. **Solutions above TRL6 maturity level.**
- **Areas of interest: Nitrogen and Phosphorus nutrient recovery**, novel technologies and innovative fertilizers, food safety and supply security, sustainable food production.

Reasons:

- Ensures that when the new **EU Fertilising Products Regulation law harmonization is reaching implementation status in 2022, the agricultural practitioners already know, have tried and are applying such recovered products in practice**.

For whom: Farmers, advisors, businesses, applied researchers, NGOs, etc.

Bottom-up approach = the farmers' point of view

The NUTRIMAN project – key activities

1. **IDENTIFICATION** of **matured innovative research results** in the field of **N/P recovery** EU28 **technologies & products**, which are near to be put into practice, but not sufficiently known by agricultural practitioners.
2. **EVALUATION** of innovative N/P nutrient recovery technologies & novel N/P fertiliser products and practices, **both by experts and by the potential end-users.**
3. **COMPILATION** of **"ready for practice" knowledge in a form of EIP-AGRI practice abstracts**, **info sheets**, multi-lingual (8 languages) product application and **training materials**, audio-visual materials and infographics.
4. **SHARING & SPREADING** the collected knowledge **towards agricultural practitioners** (farmers, farmer organisations, advisory services) during online webinar and face-to-face workshops across Europe.
5. **LONG TERM OPERATION** (up to year 2031) of 8 languages interactive practice oriented **NUTRIMAN farmer platform**:

https://nutriman.net/farmer-platform

TRL Technology IRL Investment CRL Commercial Readiness Level
NUTRIMAN operational area: beyond successfully completed >TRL6.

Technology Readiness Level "TRL" & Investment Readiness Level "IRL" & Commercial Readiness Level "CRL"

EU Community S&T - RTD maturity progress

TRL & IRL & CRL EVOLUTION schedules and capabilities Status of RTD progress - "RMI" Research Maturity Index	TRL / IRL / CRL Implementation factor %	TRL / IRL / CRL Implementation risk %	Scientific evidence level
TRL 1-3 = IDEA = basic principles, technology concept formulated	0-1%	100%	THESIS: theoretical assumptions
TRL 4 = technology validated in laboratory	<3%	>97 %	
TRL 5-6 = PILOT technology validated and demonstrated in relevant environment **IRL5-6 = validate revenue model & market fit** high technical risk/full commercial risk — Low RMI operational area	<25%	>90%	
RTD risk break-even point			
TRL 7= PROTOTYPE demo in operational environment **IRL 7 = prototype viable product** **CRL 7 = Product design is complete**	60-75%	40-70%	Prototype demonstrated
TRL8 = FIELD DEMO system complete and qualified **IRL 8 = validate value delivery** **CRL8 = Customers** — High RMI operational area	75-90%	15-25%	Industrial validated
TRL 9 = actual system proven in operational environment, full scale industrial replication model ready for market competitive commercial deployment. **IRL 9 = identify and validate metrics** **CRL 9 = Commercial deployment** The TRL9/IRL9/CRL9 is the first full industrial/market/commercial replication model. Demonstrate conversion of science into practice: competitive manufacturing, industrial training, user/market uptake and exploitation in practice.	95-99%	1-5%	Market validated for commercial replication
Industrialized and market competitive commercialized innovation	97-99%	1-5%	Commercial replicated

- ✓ **The TRL** (also known as Technology Readiness Assessment "TRA") is based on the EU Commission Decision C(2014)4995 and US official methods since 1980's (NASA, DoD, ESA, ISO 16290:2013 standard).
- ✓ **The IRL** is based on the OECD (The Organisation for Economic Co-operation and Development) and other large financial institutions methods www.oecd.org. IRL is an evidence based demonstration to investors, that there's a repeatable and scalable business model.

The NUTRIMAN project

- Focuses on **market competitive and commercially "ready for practice" innovative results** drawn from high research maturity applied scientific programmes and common industrial practices.
- **Brings together innovation actors** (farmers, advisors, developers, businesses, NGOs, etc.) and helps to build bridges between user-oriented applied research results and agricultural production practices.

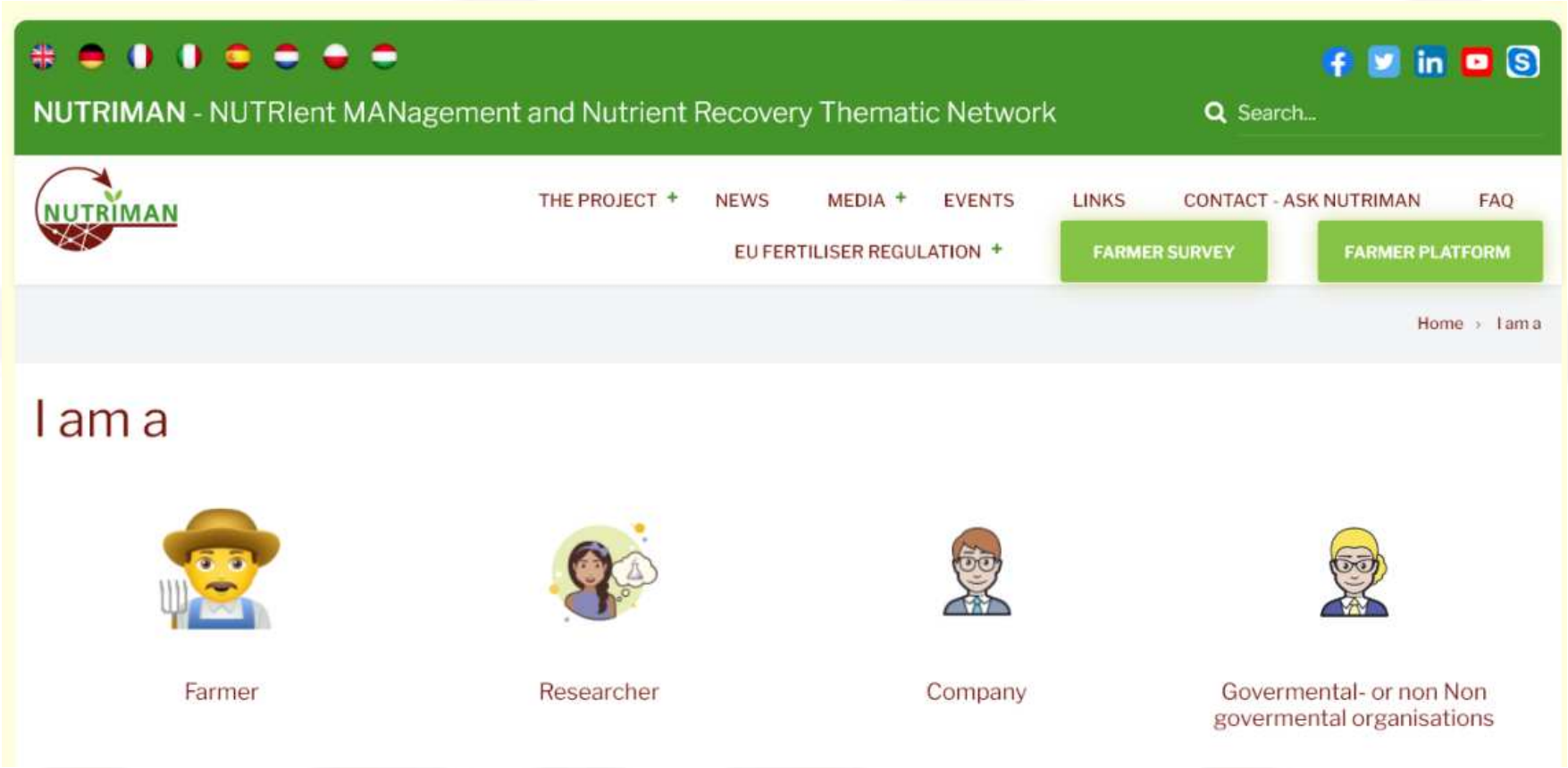
How to interact with NUTRIMAN?

- **Connect to NUTRIMAN** network: https://nutriman.net/i-am-a
- **ASK NUTRIMAN: https://nutriman.net/contact**
- **Mini survey feed back** to be replied in 8 languages (takes 1 minute only): Example:

  https://nutriman.net/farmer-platform/product/id_192#mini-survey

How to connect? https://nutriman.net/i-am-a

By selecting your end-user page you can easily acess to the **specific INFORMATION.**



Interaction with the NUTRIMAN – ASK NUTRIMAN

- **NUTRIMAN Social pages:** Facebook/Twitter/LinkedIn: @Nutrimannetwork
- **Online contact form at 8 lanuages: https://nutriman.net/contact**
  - **general questions** on the NUTRIMAN Thematic Network
  - **specific questions related to any technology and/or product published on the Farmer Platform.**
  - **Sharing your innovative nitrogen/phosphorus recovery technology/products with the farmers.**
- **The most interesting interactions will be highlighted anonymously in the NUTRIMAN FAQ sections operating at 8 languages:** https://nutriman.net/FAQS

Characteristics of the NUTRIMAN web platform

Dedicated pages:

- **Description of the main characteristics of the product or technology**
- **Guidelines** for appropriate involvement in agriculture

Are available:

- **Fact sheet;**
- **Infographics;**
- **Audio-visual materials**

Joint work of the partner of the project and companies involved

Link to the platform for farmers in **own language.**

Characteristics of the NUTRIMAN web platform

The production technology on the platform have been divided into categories:

1. Biological Nutrient recovery: Composting, anaerobic digestion, microalgae technology;
2. Phosphorus precipitation from liquid manure, waste water and drain water;
3. Thermochemical Nutrient Recovery;
4. Physic-chemical nitrogen recovery from manure, digestate and wastewater: separation, stripping and membrane processes.

The platform contains the **direct contacts:**

- fertilizer manufactures
- the developers of each of the technologies

Characteristics of the NUTRIMAN web platform

The products present on the platform have been divided by category:

1. Compost and digestate (and Biomass);
2. Ash;
3. Struvite and other P-Products;
4. Pyrolysis materials: Biochar and Bio-Phosphate;
5. Scrubber water and mineral Nitrogen Concentrate

Direct contact are available:

- fertilizer manufactures
- the developers of each of the products

QUANTIFIED RESULTS

- ✓ Multi lingual (8) practice & business oriented **web site with continuously progressive evolution** and expansion 2018–2031 **www.nutriman.net** ,
- ✓ **Qualified PRACTICE ABSTRACTS in EIP AGRI format (>80)**
- ✓ **Booklet: 25 practice abstracts on 8 languages,**
- ✓ **Practice abstracts printed (1000),**
- ✓ **Multi lingual (8) practice abstracts on pendrive (1000),**
- ✓ **Audio-visual materials (>80) ,**
- ✓ **Info sheets & infographics & extensive training/educational materials (>80)**
- ✓ **EU wide publicity made with practical demo of the FPR EU (2019)1009 and greater user acceptance achieved for innovative N/P recovery technology/product solutions.**

High number of farmers and stakeholders reached:

(8 languages EN, FR, DE, NL, IT, ES, PL, HU) → **1,500,000**

IMPACTS 2018-2031

- ✓ **Summarize, share and conserve the practical knowledge** for the long term (2031) for innovative N/P recovery solutions that are focusing on the most urgent needs of farmers.
- ✓ **Serve education and training** purposes.
- ✓ **Increase the flow of practical information** between farmers in European dimension.
- ✓ **Achieve greater user acceptance** of collected solutions and a more intensive dissemination of existing knowledge.
- ✓ **Supporting the implementation of 2030 targets** for Circular Economy, Green Deal, environmental and climate sustainability, while improving food safety and security at less cost.
- ✓ **Supporting rapid economical recovery** & creation of new jobs.

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