

ProWsper

”How to protect water, soil and plant production all together”



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Water JPI
WaterWorks2015 Cofunded Call
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CONSORTIUM DESCRIPTION

- Coordinating Organisation



- INCDCP- ICECHIM Bucharest, Romania
(**CO-PI**)-**PI: Dr. Eng. T Verona Iordache**
<http://www.icechim.ro/indexen.php>



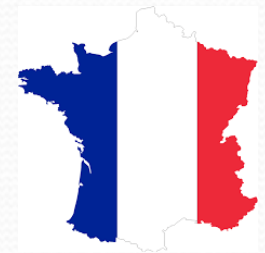
- Partner Organisations



- INCDSAE-ICPA Bucharest, Romania (**P2**)-
PI: Dr. Eng. E Carmen Sirbu
<https://www.icpa.ro/>



- MAPIEM Laboratory-University of Toulon,
France (**P3**)- **PI: Prof. Dr. F Xavier Perrin**
<http://mapiem.univ-tln.fr/>



- University of Coimbra, Coimbra, Portugal
(**P4**)-**PI: Prof. Dr. JM Artur Valente**
<https://www.uc.pt/en>



MOTIVATION

State-of-the-Art



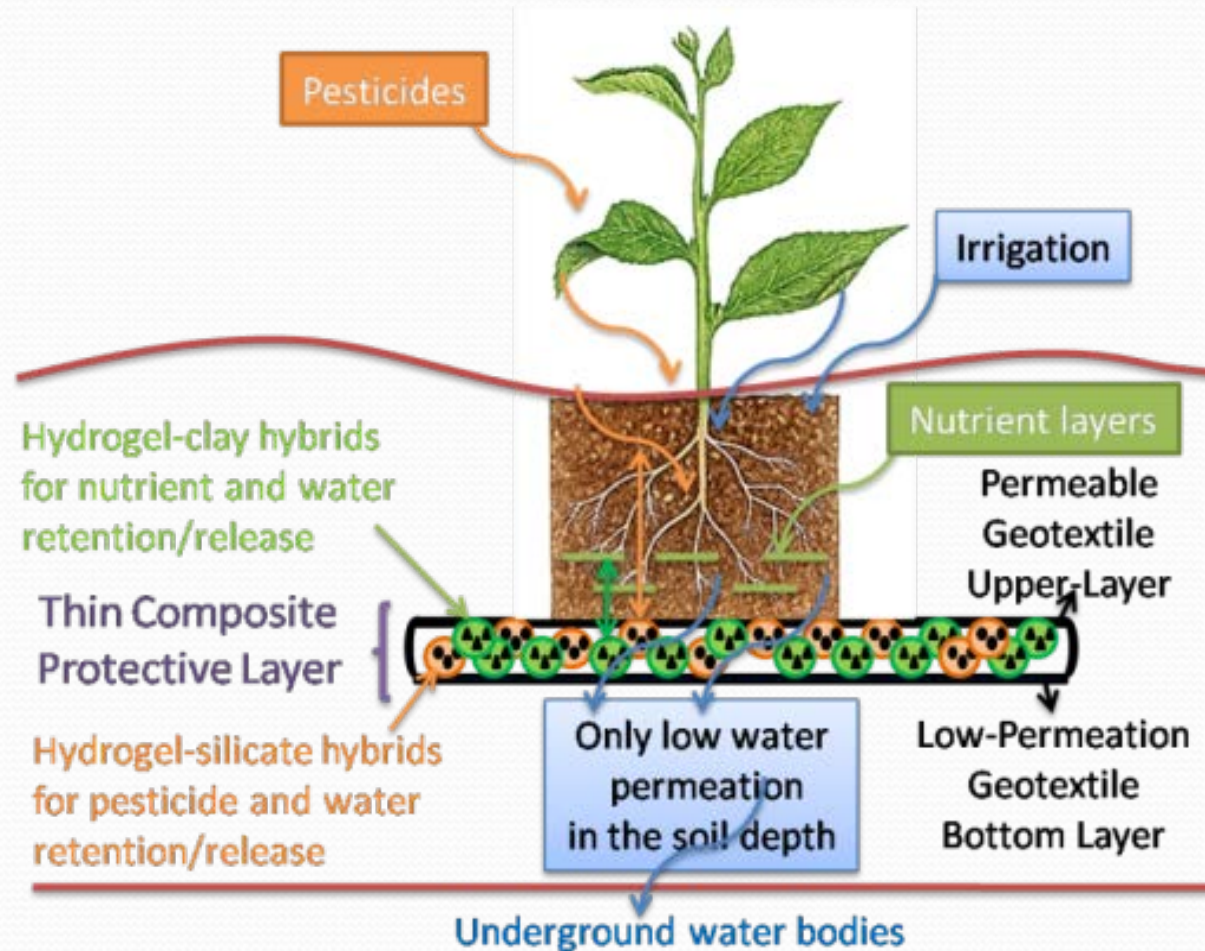
Collect wastewaters
Water and soil conservation

“Incubate” the plant
Preserve humidity
Resist to UV rays
Water conservation
Reduce worker’s expenses

MOTIVATION

ProWisper concept

- Preserve humidity
- Water and soil conservation
- Reduction of worker's expenses
- **Reduction of pesticides and fertilizers rates yielding more ecological products**
- **Unnecessary purification of wastewaters and soil remediation**



OBJECTIVES

Goal: Develop original, sustainable, and cost-effective products for protecting water and soil against nutrient and pesticide pollution while sustaining the well-balanced growth of plants

Specific objectives of ProWsper:

1. Development of the composite layers, containing a customizable mixture of hybrid fillers
2. Determination of mass transfer and adsorption-desorption profiles of targeted nutrients and pesticides
3. Measuring the efficiency of various composite designs and examining plant quality during the growing cycle
4. Communication and dissemination of Results, identification and protection of IPR.

Implementation

WPI. Preparation of the hydrogel-silicate hybrid fillers for pesticide retention. Leader PI (MI-20)

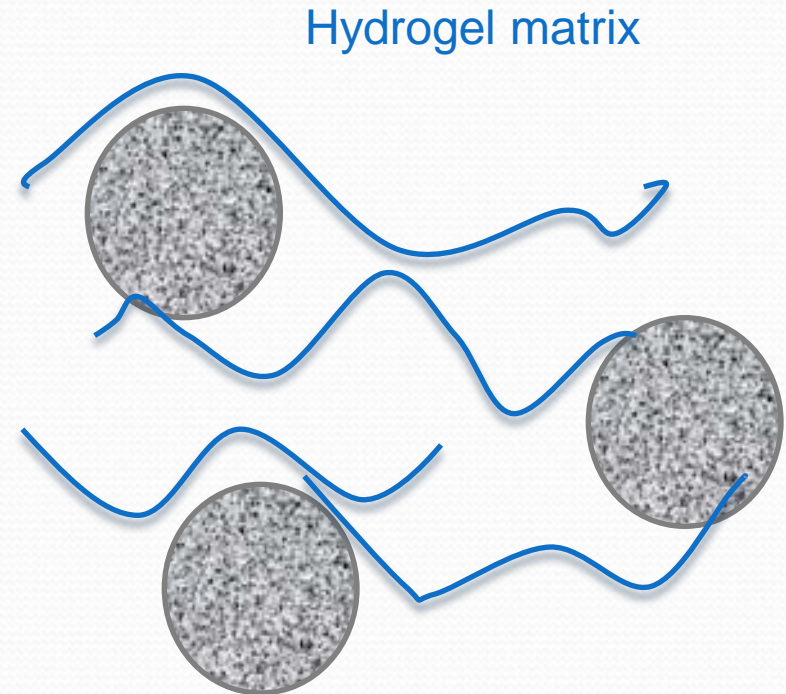
- **Objectives:**

I.1. Preparation of hydrogel-silicate hybrids to retain/release various pesticides.

I.2. Reproducibility of hydrogel-silicate hybrids for pesticides at Laboratory scale

- **Participants: P1, P2, P3 and P4**

- **Final Result: Laboratory Technology**



Silicate functionalized
by host-guest polymerisation

Implementation

WP2. Preparation of the hydrogel-clay hybrid fillings for nutrient retention. Leader P3 (M2-22)

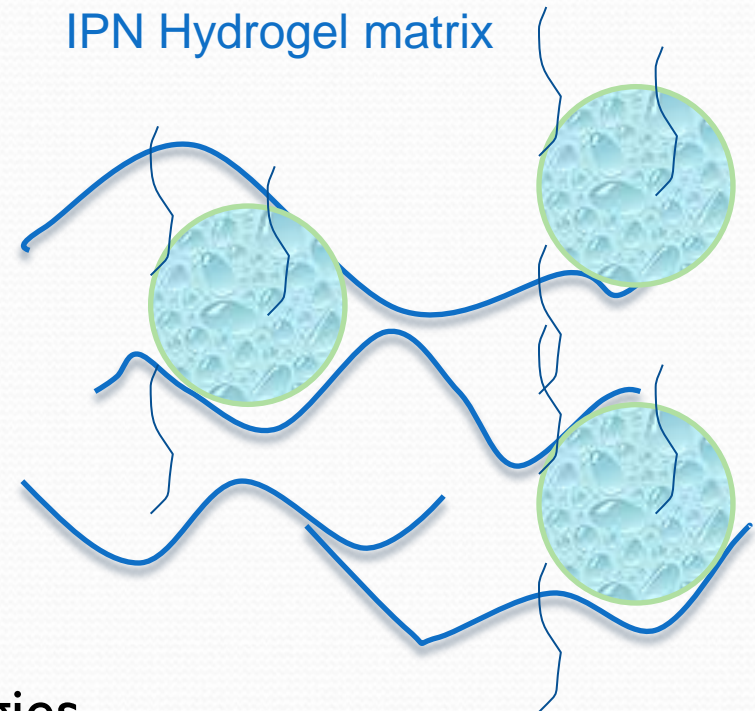
- **Objectives:**

2.1. Preparation of hydrogel-clay hybrids to retain/release various nutrients.

2.2. Reproducibility of hydrogel-clay hybrids for nutrients at Laboratory scale

- **Participants: P1, P2, P3 and P4**

- **Final Result: Laboratory Technologies**



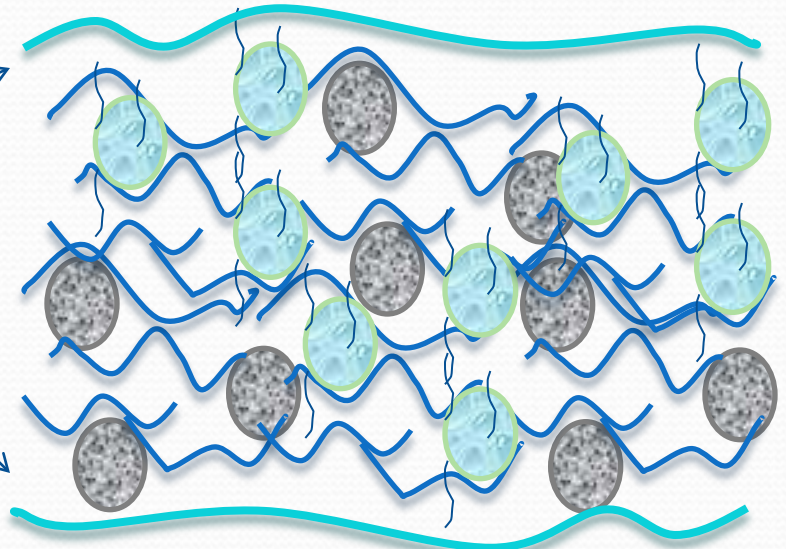
Clay functionalized by silylation

Implementation

WP3. Designs of the protective composite layers. Leader P4 (M9-24)

- **Objectives:**

- 3.1. Selection of precursor geotextile layers using membrane technologies
- 3.2. Developing at least two designs for the composite layers as function of filler spread and arrangement



- **Participants: P1, P2, P3 and P4**
- **Final Result: Prototypes**

Implementation

WP4. Validation of technologies and demonstration. Leader P2 (M21-36)

- **Objectives:**
 - 4.1. Validation of retention/release features and life-sustainability of prototypes, in laboratory conditions and out in the open and greenhouses (customization of layers)
 - 4.2. Determination of product lifespan (without efficiency loss or reconditioning) considering minimum two growth cycles of a plant.
- **Participants: P1, P2, P3 and P4**
- **Results:** DEMO Reports; Product Lifespan Report and Product Sheet

Implementation

WP5. General Project Management. Leader P1 (MI-36)

- **Objectives:**

- 5.1. Coping with scientific and administrative risks

- 5.2. Communication, Dissemination and Management of IPR

- **Participants: P1, P2, P3 and P4**

- **Results:**

Consortium Agreement; Financial & Scientific Annual/Final Reports, **Website** of ProWsp, **Newsletter**, Paper **Communications** to International Events, **Publications**, **Work Shops**, National and International **Patent Claims**, Brokerage Events (**Round Table** and **Invention Salon**).

Expected Impact of the Project

ProWspers Project:

- (i)* Propose viable and sustainable solutions to reduce soil and water pollution (“best practices” to sustain EU water policy);
- (ii)* Generate scientific added-value;
- (iii)* Increase the technical solutions and the quality levels of advanced materials and technologies;
- (iv)* Enhance opportunities for education, by providing open positions for Master, PhD Students and Post-doctoral fellows

End-Product implementation:

- (i)* Lead to more efficient management of resources (water, nutrient and pesticide)
- (ii)* Increase the health labels of the population, by improved quality of waters, soils and plants (more ecological food)

Multidisciplinarity, Mobility, Research level and Collaborative effort of ProWspers

- Promotes multidisciplinary work as it gathers researchers and specialist from chemical engineering, macromolecular and materials science, and soil/water/agriculture fields to solve pollution issues
- Encourages fundamental and applied research to prove and validate the proposed concept (TRL 1 - TRL 6)
- Stimulates mobility of researchers through work meetings and student exchange between Partners
- Enhances the collaborative effort through the fact that all WPs are interconnected. Plus, the success of this concept will create new project ideas for future collaborations.

Thank you for your attention !



*Priorities of chemistry for a long lasting development,
October 2017*

<http://www.icechim.ro/indexen.php>