



This project has received funding from the EU Horizon 2020 research and innovation programme under grant agreement No. 690323



SMART-Plant



# Phosphorus recycling in organic fertilizers

Dott. Cristian Argenta / Technical manager Italpollina

3rd EUROPEAN NUTRIENT EVENT @ ECOMONDO 2018

8 - 9 November 2018, Rimini, Italy

[www.smart-plant.eu/ENE3](http://www.smart-plant.eu/ENE3)





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Italian Phosphorus  
Platform



## The Company

***“Italpollina SPA is an Italian company specialized in plant nutrition, an international leader in the production of:***

- organic fertilizers***
- natural biostimulants (vegetal hydrolyzates)***
- useful micro-organisms (bacteria, fungi, ...)***

***Our mission:***

***use the scientific knowledge to develop solutions (techniques and products) that meet the needs of farmers following the principles of eco-efficiency and sustainability, respecting nature and safety for humans.***



ITALPOLLINA  
HELLO NATURE!



## ITALPOLLINA AND THE CIRCULAR ECONOMY

We recycle Phosphorus from  
manure to produce organic  
fertilizers



Italian Phosphorus  
Platform



# ITALPOLLINA AND THE CIRCULAR ECONOMY

➤ ITALPOLLINA is member of AISEC:



Associazione Italiana per lo Sviluppo  
dell'Economia Circolare

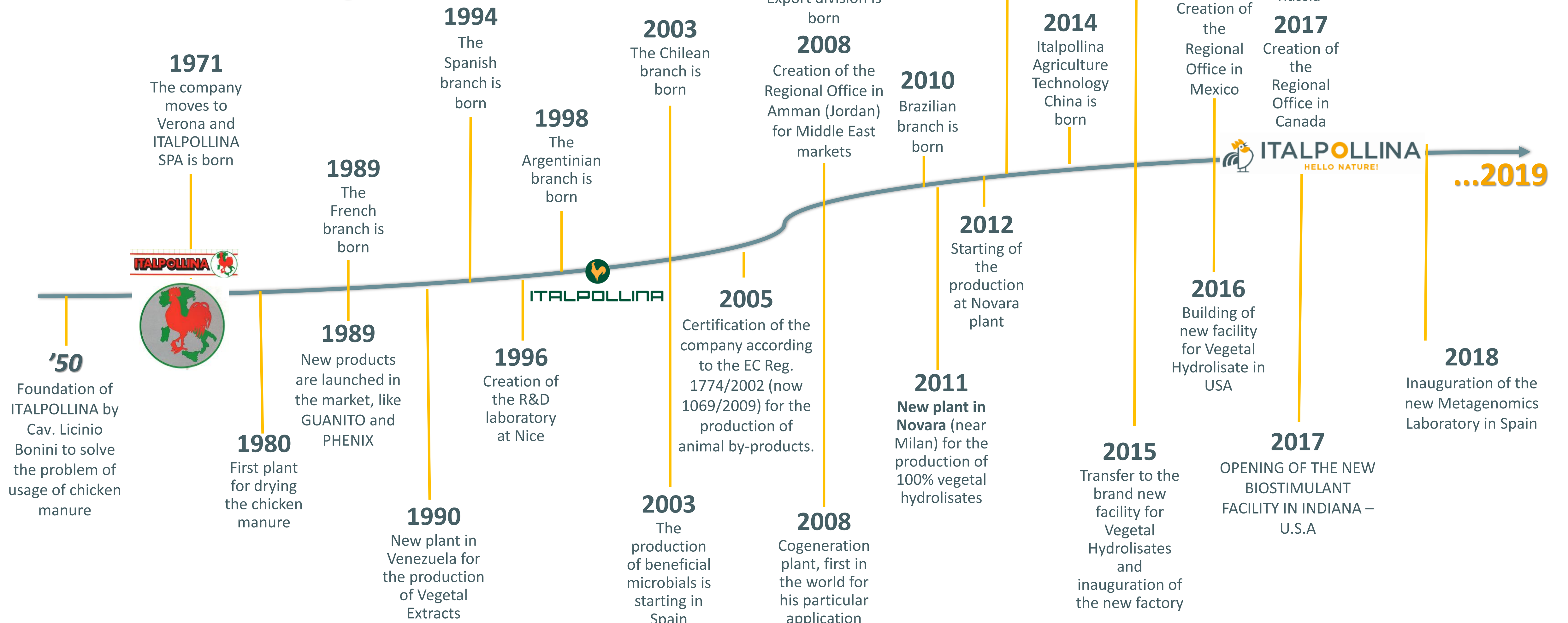
The Italian Association for the Development of Circular Economy is a non-profit association that aims to promote, disseminate and apply the concept of Circular Economy both nationally and internationally.



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# Our history...



## ...TILL TODAY!

### ➤ Sales Volume:

- 120.000 Tn/year of finished pelletised products
- 1.000.000 It of Vegetal hydrolysates
- 100.000 It of Beneficial Microbials

### ➤ Turnover: > 50.000.000 Euro (dec. 2017)

### ➤ Potential Production:

- 200.000 Tn/year of organic fertilizers
- 3.000.000 It of Vegetal hydrolysates

### ➤ Employees: 130 people

### ➤ Plants: 4

- 2 in Italy
- 1 in Spain
- 1 in Anderson (Indiana – USA)

### ➤ R&D: 5% of the total Turnover





# THE GROUP

**WORLDWIDE SALES NETWORK**

## Europe

- Italpollina Italy
- Italpollina France
- Italpollina Iberica
- Italpollina Russia

## Asia and ME

- Italpollina China
- Italpollina Korea
- Italpollina Jordan

## Americas

- Italpollina USA
- Italpollina Argentina
- Italpollina Mexico
- Italpollina Brazil
- Italpollina Canada





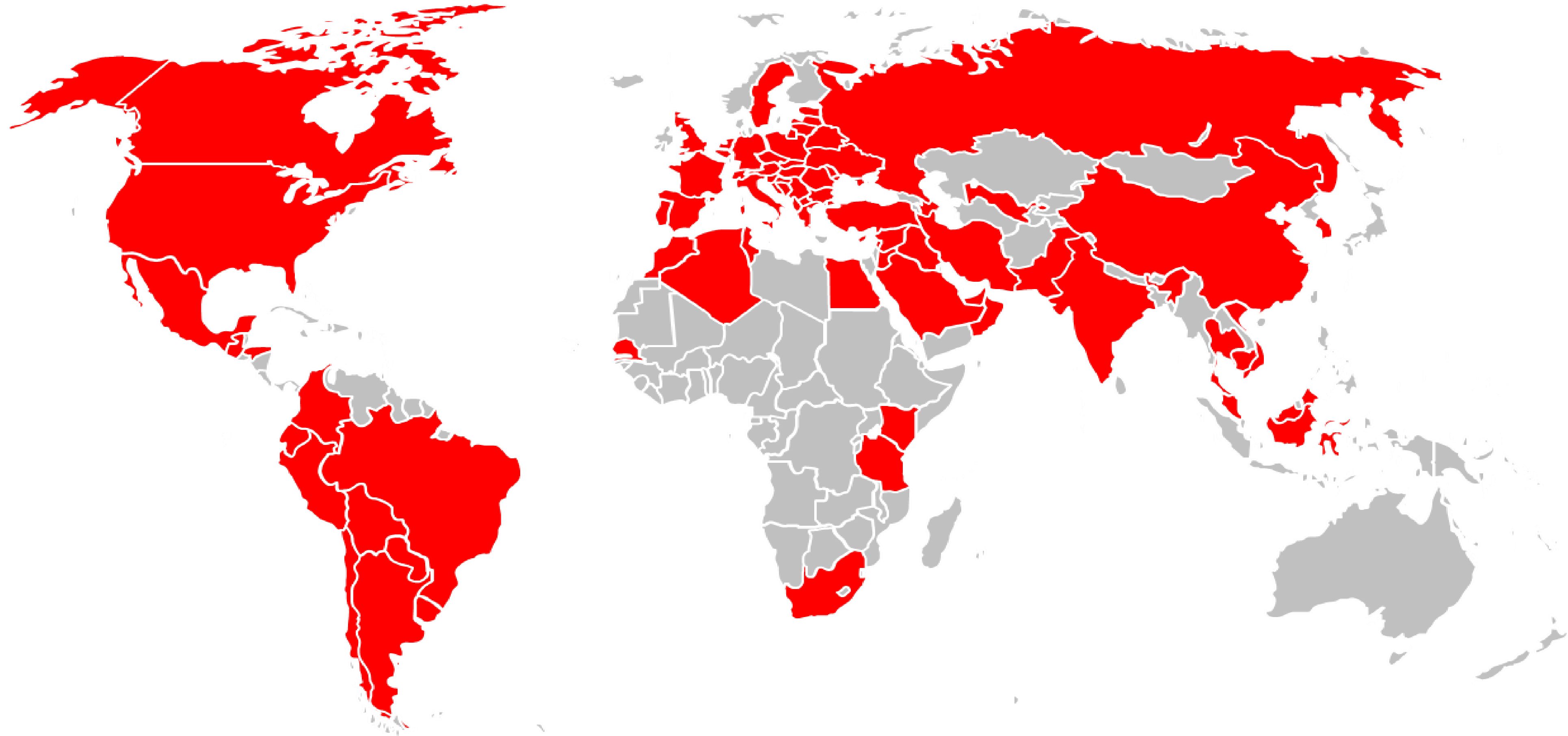
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# WORLDWIDE SALES NETWORK



2018: we are present in more than 80 Countries...

[www.smart-plant.eu/ENE3](http://www.smart-plant.eu/ENE3)





# RESEARCH & DEVELOPMENT

## 3 R&D laboratories (France – Spain - USA):

- Applied research on plant nutrition
- Chemical and microbiological analysis for quality control
- Biological applied research
- Applied research on beneficial microbilas for plant health and nutrition
- Research and formulation of liquid fertilizers from amazonian plant juices

15 researchers between chemical engineers, chemical and biological analysts make part of the Group R&D department.





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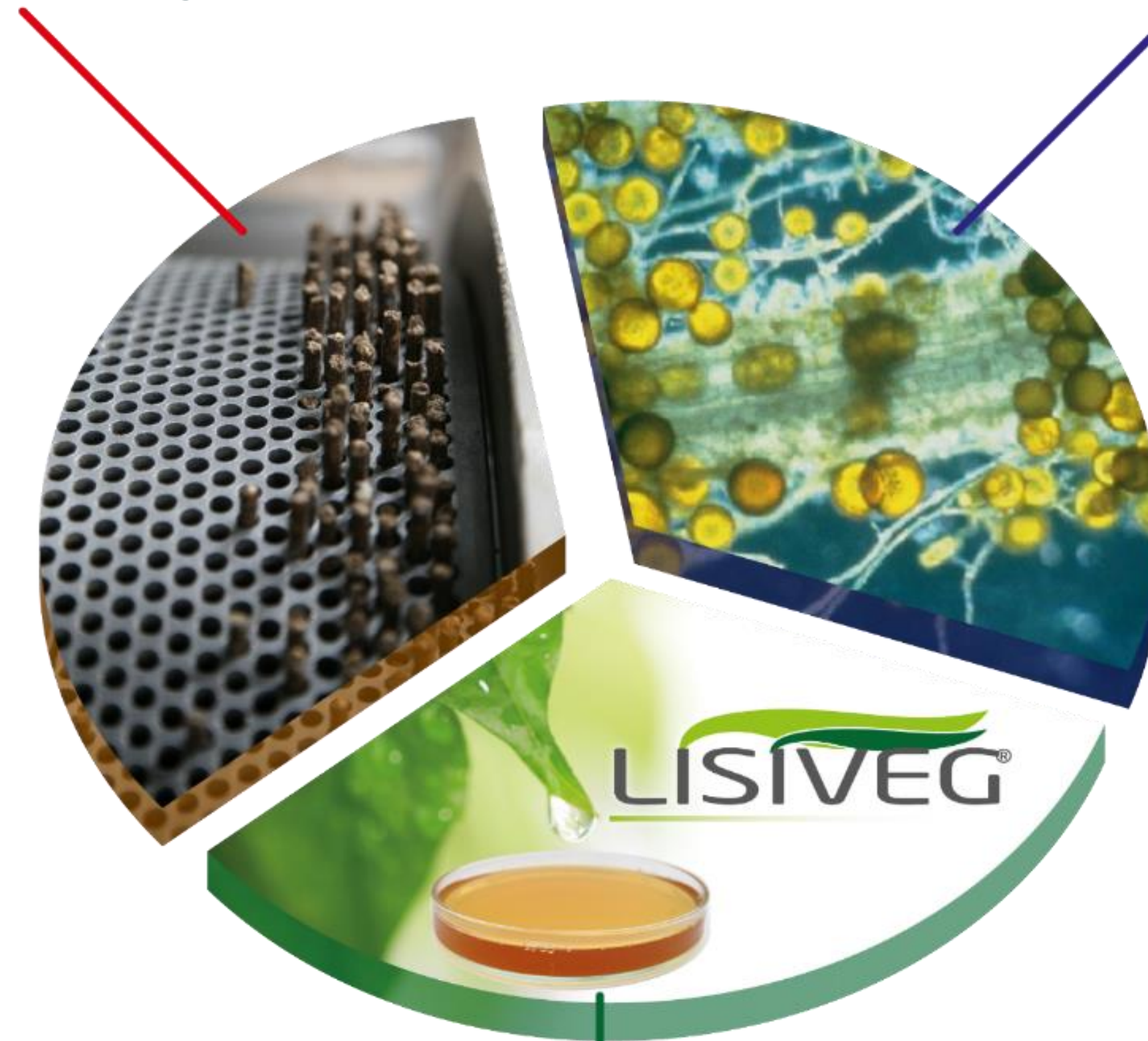


## DRYING TECHNOLOGY IN CONTROLLED ENVIRONMENT

for the production of Organic and Organo-mineral fertilizers

## IN VIVO

reproduction of beneficial microbials



# OUR TECHNOLOGIES

LISIVEG

for the production of vegetal hydrolysates

[www.smart-plant.eu/ENE3](http://www.smart-plant.eu/ENE3)



# DRYING TECHNOLOGY IN CONTROLLED ENVIRONMENT

for the production of Organic and Organo-mineral fertilizers

## Safety for human health:

- ✓ No pathogens (E.Coli, Salmonella, etc.)
- ✓ No heavy metals (Cr, Cd, Ni, As)

## Safety for the environment:

- ✓ No weed seeds

## Highest quality:

- ✓ No glues or additives for pelleting
- ✓ Always the right formula



# Manufacturing process

- Quality raw materials: manure, feather meal, guanos ...
- Manure naturally rich in bacteria
- Health guarantees : CE 1069/2009
- Certification ISO 90001 et 14001
- Pelletisation 3 mm top of the line





## SANITATION

Agreement CE 1069/2009

*Thermal treatment : 70°C during 1 hour  
(Temperature idem like composting)*

- ✓ Total destruction of all pathogens
- ✓ Useful bacteria protected
- ✓ Nutrients concentration optimized



### Pathogen agents

- ☠ Escherichia Coli
- ☠ Salmonella
- ☠ Entérobactéries
- ☠ Bactéries phyto-pathogènes

### Bacteria selected

- ✓ Thermo tolerant bacteria
- ✓ Useful bacteria
- ✓ Bacteria PGPR

✓ Complete analytical control on each manufactured batch



# USEFUL BACTERIA FOR SOILS AND CROPS

- ✓ Only saprophytics bacteria and PGPR
- ✓ In dormancy in the fertilizer, reactivation in the soil
- ✓ Perfect localization in soil and rhizosphere

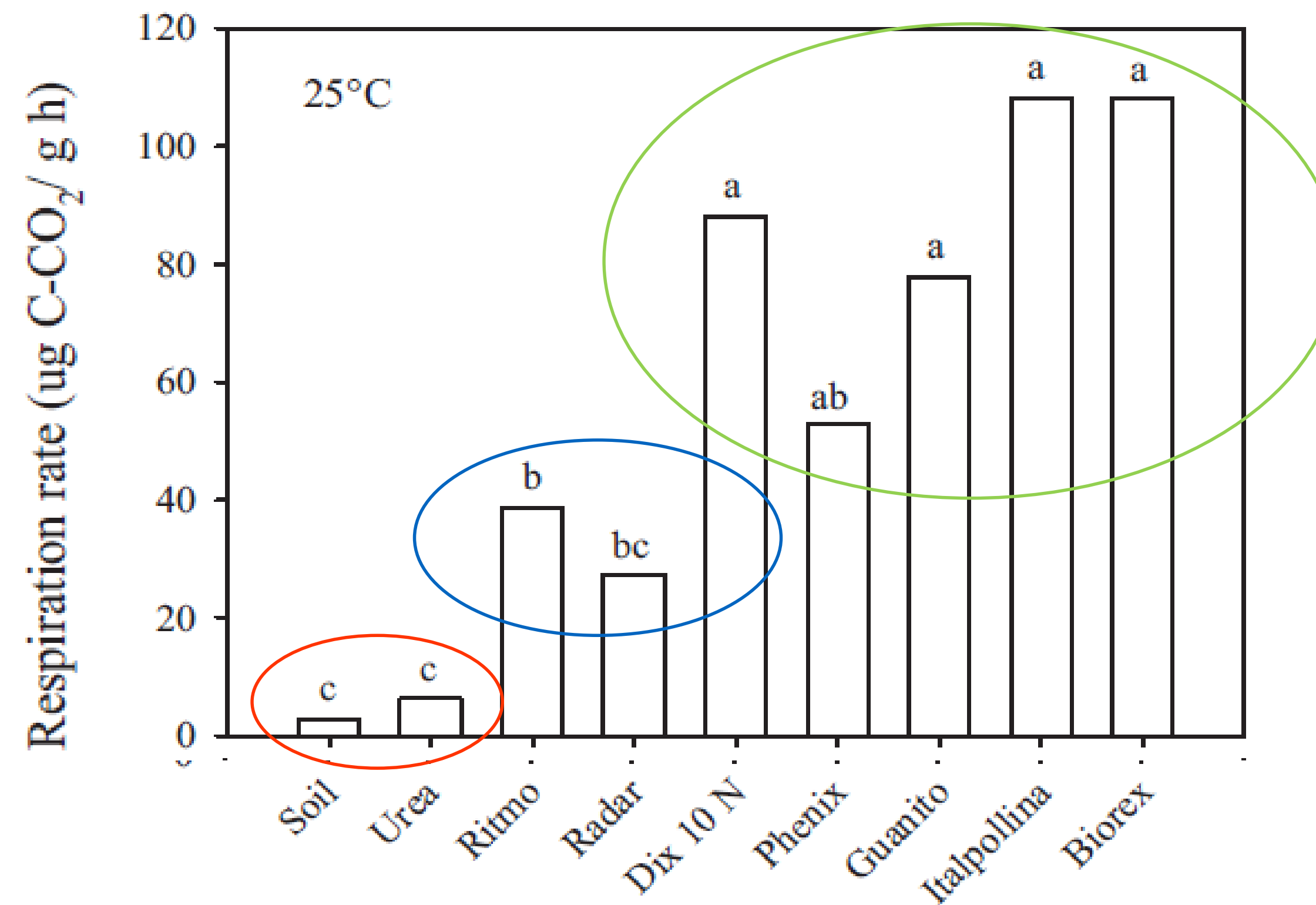
Bacteria	Role in the soil
Bacillus licheniformis	Solubilization of nutrients present in the soil.
Bacillus pumilus	PGPR bacteria: release of gibberellins and nitrogen fixation. Anti sclerotinia on rape ( <u>Acapela</u> product)
Bacillus stearothermophilus	Bacteria from composting degradation of organic matter.
Paenibacillus polymyxa	PGPR bacteria: auxin and cytokinin Releasing. Solubilization of phosphorus, protection of the root system.
Paenibacillus macerans	Nitrogen fixation, production of polysaccharides, help to soil aggregate formation.
Lactococcus lactis lactis 1	Solubilization of soil nutrients (phosphorus) Stimulating the development of other bacteria, soil aggregate formation.



# POSITIVE EFFECT OF BACTERIA LIFE SOIL

**Soil control:** sandy soil cultivated with 0,6 % of MO.

**Modalities :** fertilizers tested at same Nitrogen doses (0,84 mg N / g sol)



**Figure 1:** Soil respiration response to added fertilizers determined at 10 and 25 °C.

Source : M. Cardarelli<sup>1</sup>, A. Salerno, E. Rea, G. Colla - University of Tuscia

# INTEREST OF ITALPOLLINA CHICKEN MANURE

## ANIMAL MO

- Biological activity
- Degradation of crop residues
- Nitrogen mineralization
- Solubilization of nutrients
- **Rich in Phosphorus**

## VEGETAL MO

- Stock of stable humus
- Soil structure
- clay-humus complex
- Porosity and permeability of the soil
- water holding capacity



# IMPROVE SOIL FERTILITY



NPK  
4 - 4 - 4

- Centred in NPK nutrients
- **Good content of Phosphorus**
- Low and progressive release

Useful  
Bacteria

- Biological soil stimulation
- PGPR : direct action on rhizosphere



## Composition

N total	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	MgO	TE	OM	C/N	Humidity
4%	4%	4%	1 %	0,1%	70%	8,8	12%

**Raw materials: 100 % chicken manure**





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*The Classics*

# Organic fertilizers



Composition NPK + MgO	2,8 – 2,5 – 3	4-4-4	5-5-8 + 2	6-15-3 + 2	6-8-15 + 3	9-2-2
OM rate	65 %	70 %	60 %	55 %	50 %	82 %
C/N	11,6	8,8	6	4,6	4,2	4,6
Humidity	16 %	12 %	8 %	7 %	7 %	7%



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**ECOMONDO**  
THE GREEN TECHNOLOGIES EXPO

Green & Circular Economy  
6-9 Novembre 2018  
Rimini Italy

22ª Fiera internazionale del recupero di materia ed energia e dello sviluppo sostenibile

IN CONTEMPORANEA CON  
**KEY ENERGY**

Thanks...

