

BIO-BASED FERTILIZER APPLICATIONS : FROM NATIONAL TO EUROPEAN LEVEL - FEEDBACKS FROM EUROPEAN PROJECTS NUTRI2CYCLE AND NUTRIMAN

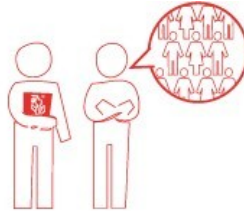
Jean-Philippe Bernard, Chamber of agriculture
of Charente-Maritime and Deux-Sèvres

Training session "Innovative applications of
bio-based fertilizers in modern agriculture"

La Rochelle, 23/04/2024

ABOUT THE CHAMBERS OF AGRICULTURE IN FRANCE

Founded in 1924, the French Chambers of Agriculture are public bodies representing French farmers and the rural world.



FRENCH CHAMBERS OF AGRICULTURE TWO MAINS ROLES

Their two main roles are :

- **A technical role** : a wide range of services provided to the farmers and to other rural stakeholders. The French Chambers of Agriculture are self-governing public bodies which are recognised by the French rural code and French law
- **A consultative role** on agricultural and rural issues

THE CHAMBERS OF AGRICULTURE, THE FARMERS' VOICE

The Chambers of Agriculture represent the farmers and foresters to local authorities.

They are managed by elected representatives from the agriculture and forestry sectors. The election system, together with a large electorate, gives the Chambers of agriculture a legitimate role.

THE ELECTION SYSTEM

- **Elected members** designated every 6 years
- Electorate about **3,000,000 individual voters** and **50,000 group voters**

THE CHAMBERS OF AGRICULTURE, KEY PARTNERS FOR PUBLIC AUTHORITIES

At the public authorities' request, each Chamber of agriculture is authorised to provide expertise and give its views on :

- Developing agricultural production and the forestry sector
- Managing rural areas and local development
- Preventing natural risks
- Developing rural areas and landscapes
- Environmental protection

SUPPORTING AND ADVISING FARMS

Main field of activity for the Chambers of agriculture at "département" level

- Creating and establishing new businesses
- Business development
- Implementing the Common Agricultural Policy (CAP)
- Diagnosis and consulting for farms in difficulty
- Legal and asset management for farms
- Corporate strategy for agricultural engineering farm buildings



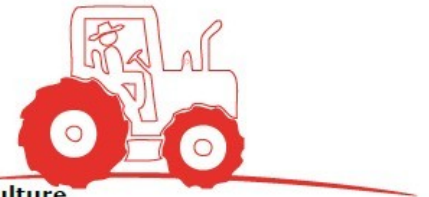
SUPPORT FARMERS

- **1,400 farmers' groups** guided by the Chambers of agriculture
- **54 experimental stations** managed by the Chambers of agriculture
- **245,000 farmers trained** in Certiphyto (crop protection), among which 44 % by the Chambers of Agriculture in 2014
- **3,500 plant health newsletters** on the Chamber's websites per year

DEVELOPING AGRONOMY AND GOOD ENVIRONMENTAL PRACTICES

Developing environmental efficiency : a second priority area for the Chambers of agriculture

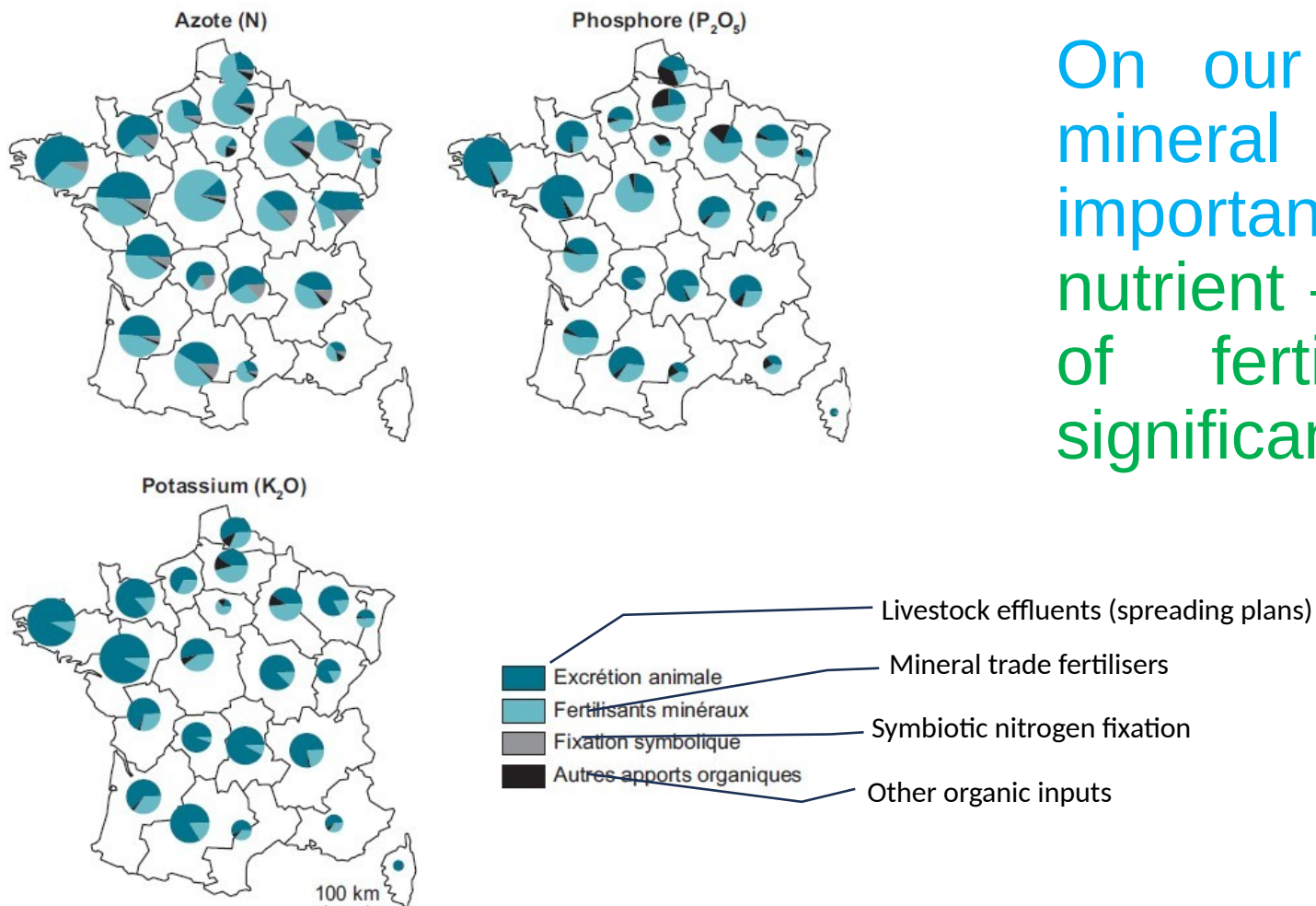
- Implementing global environmental strategies for territories
- Managing and optimising fertilisation
- Crop protection (technical advice for farmers on plant protection practices)
- Managing water, soil quality and renewable energy
- Implementing farm environmental regulations



BIO-BASED FERTILISERS (BBF) : A NEW STRATEGY FOR FERTILISATION MANAGEMENT

- *On a European scale* : a new regulation (RUE 2019/1009) for more sustainable fertilising practices
 - ⇒ to decrease EU dependency relationship to non-renewable resources
 - ⇒ To improve agronomical recycling of wastes.
- *On the French national scale* : several regulatory devices to set up operations for agronomical recycling of various effluents
 - ⇒ *Methodological framework* : spreading plan
 - ⇒ Considered as a public interest operation
 - ⇒ A real boost since the 90ies

IN FRANCE : A WIDESPREAD PRACTICE OF EFFLUENTS RECYCLING



On our national level, the part of mineral fertilising application is important but depending on the kind of nutrient – N,P or K - the effluents part of fertilising practices is quite significant.

From HOUOT and col., 2016

2008-2010 data for N and 2011 – 2013 data for P and K

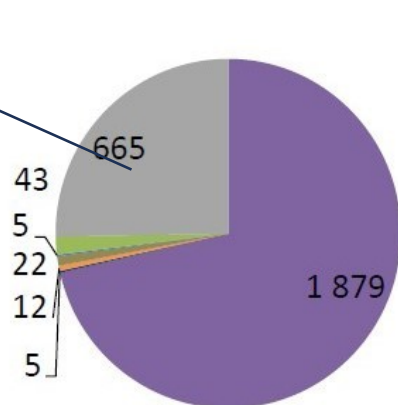
IN FRANCE : MINERAL VERSUS ORGANIC

Livestock effluents recycled with spreading plan

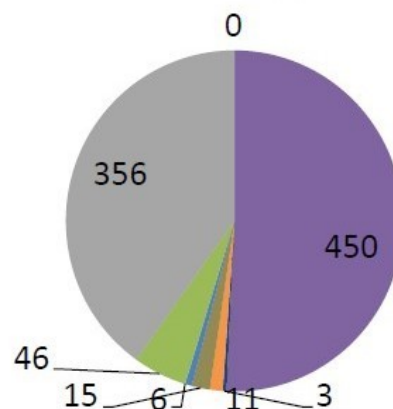
Mineral trade fertilisers

- (1) Amendements minéraux basiques
- (2) Engrais minéraux
- (3) Engrais organo-minéraux
- (4) Engrais organiques élaborés
- (5) Engrais organiques bruts
- (6) Amendements organiques élaborés
- (7) Amendements organiques bruts
- Effluents d'élevage épandus localement

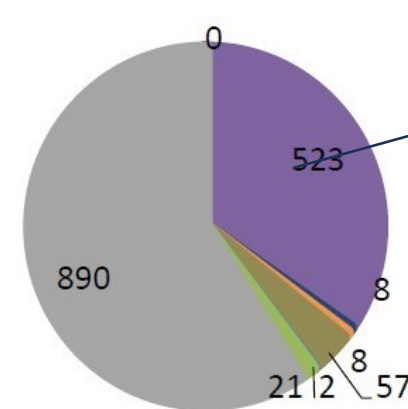
2 632 kt de N total



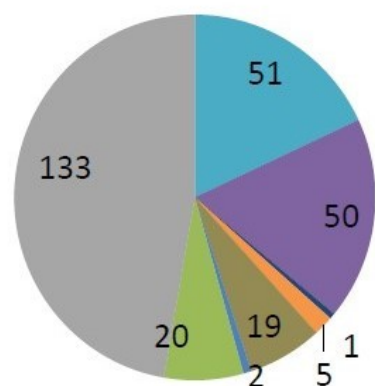
886 kt de P₂O₅ total



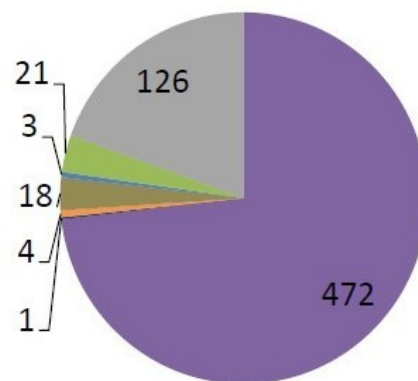
1 510 kt de K₂O total



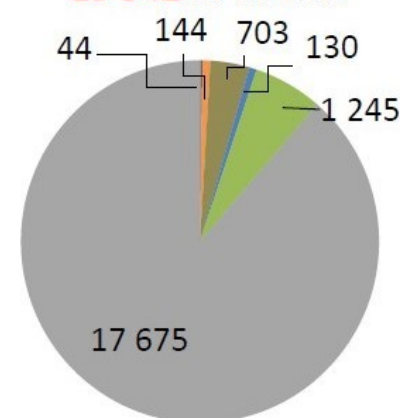
281 kt de MgO total



645 kt de SO₃ total



19 942 kt de MO



From : French National Observatory of Mineral and Organic Fertilisation, UNIFA and AFAIA – results 2021

INCREASING BBF' USE : R&D EUROPEAN PROJECTS

In 1996, to support the project for a new european regulation : a focus group "Nutrient recycling" in EIP-Agri (actually EU CAP Network)

⇒ *different projects to increase BBF production and use.*

Two cases of project :

NUTRIMAN and Nutri2Cycle

<https://ec.europa.eu/eip/agriculture/en/content/nutrient-recycling.html>

https://ec.europa.eu/eip/agriculture/sites/default/files/eip-agri_fg_nutrients_recycling_final_report_2017_en.pdf



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 818470.



Nutri2Cycle

Transition towards a more carbon and nutrient efficient agriculture in Europe



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 773682.

NUTRIMAN : NUTRIENT MANAGEMENT AND NUTRIENT RECOVERY THEMATIC NETWORK

NUTRIMAN : inventory of nutrient recovery products and processes.

<https://nutriman.net/>

To find informations about

- New process to recovery nutrients from wastes
- Bio-based fertilisers already existing

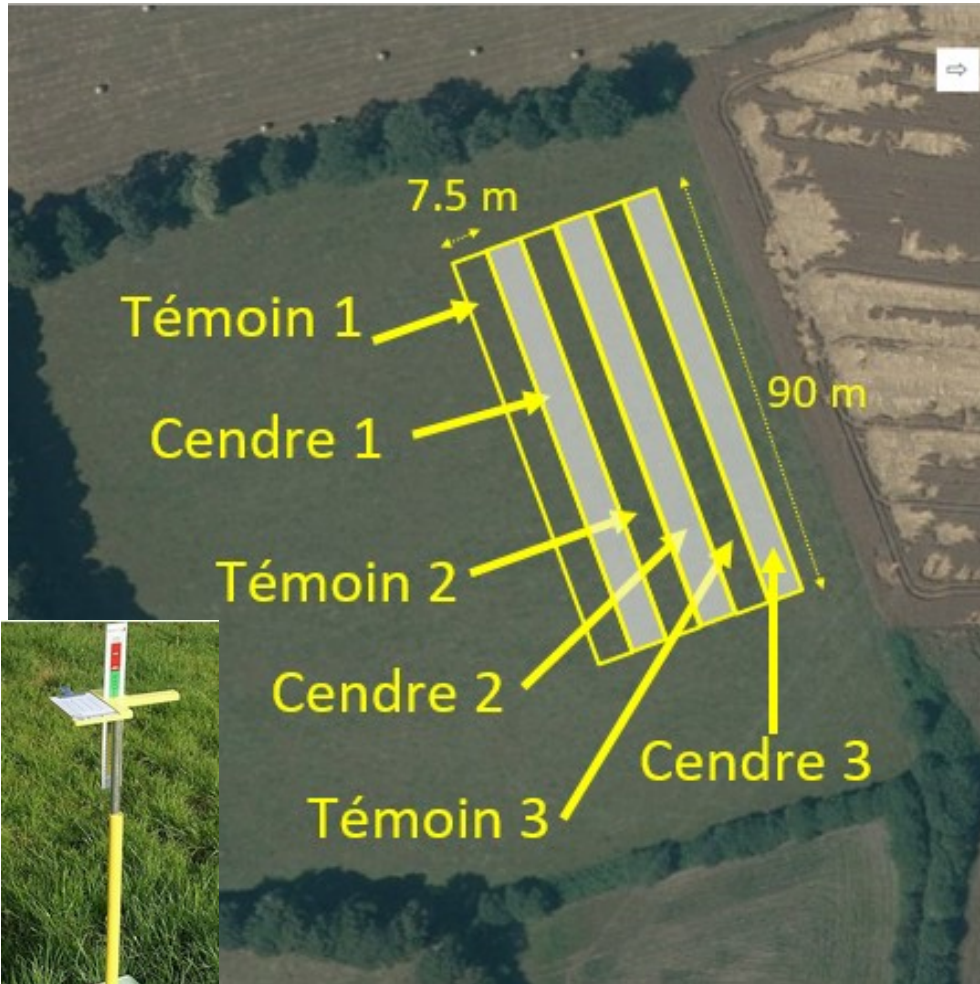
Our participation to this project allowed us to test 3 kinds of BBF and to bring results from field demonstration :

1. Ashes from natural wood chip under fireplace ([ID 321](#)) – demonstration driven by CA of Brittany
2. NPK organic fertiliser from dried poultry droppings with SECONOV dehydration process ([ID 370](#))
- demonstration : CA of Charente-Maritime
3. Compost from algae and cattle manure ([ID 540](#)) – demonstration : CA of Charente-Maritime

[For more informations](#)



NUTRIMAN : DEMONSTRATION WITH WOOD ASHES



- Application on a grassland after grazing on July 2019 : 3 strips with ashes (*Cendre 1/2/3*) and 3 strips as control (*Témoïn 1/2/3*)
 - Monitoring with a plate meter - between 17 and 24 measures done by the farmer himself
- ⇒ Growth rates are improved from 20% to 70% in the year following application.
- ⇒ Cumulative yields increased by 20% 13 months after the spreading

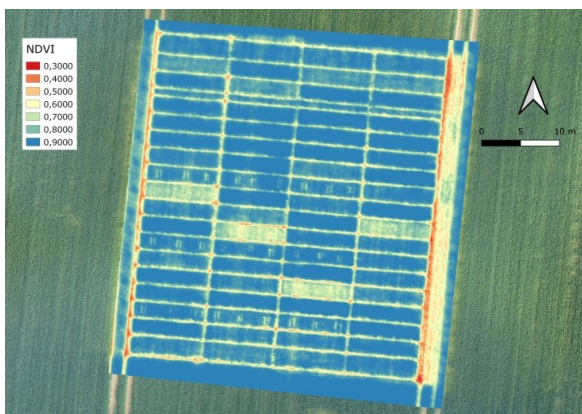
Source : D. HANOCQ (CA of Brittany), 2020

NUTRIMAN : DEMONSTRATION WITH DRIED POULTRY DROPPINGS (DPD)

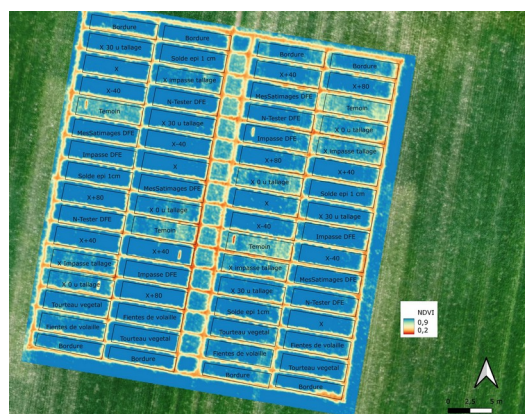
2 field trials about fertilization on winter wheat including

- a control plot without N fertilisation,
- a plot with mineral fertiliser,
- a plot with DPD.

NDVI map on 07/05/2020



NDVI map on 21/03/2022



| Harvest | Dose (u N/ha) | fertilisation | Yield (t/ha - 15% moisture) | | |
|---------|---------------|---|-----------------------------|-----|------|
| | | | Control | DPD | Urea |
| 2020 | 164 | Input of DPD in 3 parts like the urea | 2,1 | 3,8 | 6,7 |
| 2022 | 180 | One input of DPD on January the 18th 2022 | 4,6 | 6,4 | 6,8 |

NUTRI2CYCLE : TRANSITION TOWARDS A MORE CARBON AND NUTRIENT EFFICIENT AGRICULTURE IN EUROPE

NUTRI2CYCLE (N2C) : provide an essential contribution to the circular economy by closing nutrient loops.

<https://www.nutri2cycle.eu/>

N2C aimed to help closing nutrient loops by :

- Identifying the most efficient types of farm systems in Europe,
- Defining indicators to monitor closed nutrient loops,
- proposing 16 pilot cases as light-house examples.

Our participation to this project allowed us to follow agronomical recycling of effluents on two farms :

1. [Goose manure and slurry on an agroforestry plot with arable crops,](#)
2. Oil-cake from oleic seeds



Nutri2Cycle

Transition towards a more carbon and nutrient
efficient agriculture in Europe

TO CONCLUDE : A PARADIGM SHIFT

- A real efficiency of the studied BBF but depending on matching of climate and soil background with fertilisation itinerary ⇒ ***Change our way of managing fertilisation after seventy years with mineral fertilising products.***
- To substitute fertilising products from fossil resources with recovered nutrients is an ambitious project but...
 - ⇒ ***Is the wastes stream enough for substitution ?***
 - ⇒ ***Is the cost of recovering nutrients from waste really sustainable ?***

THANK YOU FOR YOUR ATTENTION

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Nutri2Cycle
Transition towards a more carbon and nutrient
efficient agriculture in Europe

PROJECT PARTNERS



UNIMOS
alliance



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