RÉPUBLIQUE FRANÇAISE
Liberté Égalité Fraternité

INRAE

INTAB

EXPLORATORY PROJECT

2023-2024

Drivers of biogeochemical and energy flows circularity in OA: exploring three types of organic regional synergy

Coordination

Souhil Harchaoui,
UMR SAS
souhil.harchaoui
@inrae.fr

Fabrice Béline,
UMR OPAALE
fabrice.beline@inrae.fr

Aurélie Wilfart,
UMR SAS
aurelie.wilfart@inrae.fr

Keywords

Circularity
Region
Farm
Nutrients
Energy

Organic agriculture (OA) is limited by the availability of nutrient resources essential for plant growth. One of the levers for scaling up OA is to promote the circularity of nutrient flows, nitrogen and phosphorus in production systems at different levels of organization, ranging from infra-farm (plot, workshops) to supra-farm (groups of farms, region). However, little is known about how matter and nutrients are exchanged between OA farms and other sources of fertilization in the region, or about the associated energy invested related to these flows.

The intAB project seeks to identify the biophysical drivers of circularity between OA farms in a given region for the purpose of closing biogeochemical and energy flows. Its objectives are two-fold:

- to characterize the fertilization methods used by OA farmers in a given region;
- to develop and evaluate internal and external circularity indicators for OA farms.

INRAE units

OPAALE, Rennes
SAS, Rennes

Partners

GAB-FRAB network,
Brittany Council

© Quentin Bellanger

The project is based on the collection of data concerning exchanges of matter, nutrients and energy for ten farms involved in three different types of regional synergy:

1. Farms with compost/straw exchanges.
2. Arable farms without livestock or with monogastric production.
3. Specialized vegetable farms with high organic fertilization requirements.

The results will be contextualised by analyzing responses from a qualitative online survey on fertilization methods, targeting all OA farms within the study region (a part of Finistère).

The project's originality lies in:

- consideration of the energy cost of circularity;
- the system approach, to link the different levels of flow organization (farm and regional scales).

The intAB project calls on know-how in industrial ecology (circularity), process engineering (manure processing, nitrogen flows), agronomy and animal production (environmental assessment), and modeling.

Contact METABIO
metabio@inrae.fr