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Coordinator

Mathieu Spérandio (UMR TBI)
sperandio@insa-toulouse.fr

Key words

Recovery
Urine
Urban area
Valorisation
Bioeconomy
Fertilisers

INRAE divisions
AGROECOSYSTEM
ECOSOCIO
TRANSFORM



TEVALU

Urine recovery in urban areas



Production of nitrogen fertilizer, urine reprocessing, circular flows

Context and challenges

Separating and recovering urine at the source is of particular interest for increasing the circularity of nutrients, notably nitrogen and phosphorus since urine consists of 86% nitrogen and 60% phosphorus per person. On the scale of a region like Ile-de France, human excreta represent 22% of nitrogen and 13% of phosphorus inputs by synthetic fertilisers since producing nitrogen fertilisers requires large quantities of fossil resources since the Haber-Bosch process uses large quantities of fossil gas.

The environmental benefits of implementing regional urine recovery schemes in can be significant:

1. Reducing the use of fossil resources, by reducing the use of the Haber-Bosch process;
2. Mitigating climate change thanks to a decrease in traditional fertiliser production and direct reduction of greenhouse gas emissions originating from the treatment of nitrogen in treatment plants.

Goals

This project is designed to study urine recovery at regional scale via an innovative extraction process for use on farms, and assess the impact on sanitation services. It aims to respond to the challenges that arise from separating urine at the source by evaluating:

- The technical feasibility of producing one or several fertilisers from urine and their environmental impact. A physico-chemical profile of the product will be drawn up to determine the potential of the fertilisers produced and guide their uses. The operating data obtained from the pilot unit will also be used to qualify the treatment process in terms of its environmental footprint;
- The regional feasibility of urine separation in terms of its deposits and uses. An inventory of product use niches will be taken for the area in question and urine deposits will be mapped;
- The economic sustainability of territorial urine recovery for use in agriculture. The project will conduct an economic analysis that combines economic value related to environmental amenities and positive externalities of urine recovery.



The project is expected to advance our knowledge of products made from innovative urine treatment - in terms of both health and economics – and of the potential of implementing a system by analysing regional deposits and needs, in addition to its economic analysis.

Project members

INRAE divisions	Units	Expertise and contributions
AGROECOSYSTEM	UMR ECOSYS	Analysis of agricultural inclusion of urine in crop fertilisers
ECOSOCIO	UMR TSE-R	Environmental and water economics, monetarisation of environmental impacts
TRANSFORM	UMR TBI	Treating urine and nutrient recovery
Partners		Expertise and contributions
SOLAGRO		Circular economy and agroecology. Analysis of the uses of products derived from urine