

BBFs were unable to provide the crop/grass with all required nutrition & were thus appropriately balanced with chemical fertiliser (CF). Incorporating BBFs into the crop/ grass NMP resulted in comparable yields to the CF only treatment. For example, in 2022, CF returned a winter wheat yield of 12.9 tonnes/ha while balanced BBF treatments ranged from 12.6 to 13.5 tonnes/ha. Also, in 2022, CF returned a grass yield of 14 tonnes/ha, while balanced BBF treatments returned yields ranging from 13.6 to 14.6 tonnes/ha.



*Above:* marking out grassland trial plots pre BBF application;  
*below:* discussing BBF arable trial with a group of local tillage farmers



In addition, over the duration of the trial soil analysis showed marked increase in soil P values from commencement values at both trial sites under both CF and balanced BBF treatments.

## Stay in touch



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#Nutri2Cycle



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Nutri2Cycle  
Nurturing the Circular Economy

### National Task Forces

IRELAND - Teagasc Johnstown Castle, Co. Wexford



## 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.

# Nutri2Cycle Mission & Goals

The Horizon 2020 funded Nutri2Cycle, aimed to close C-N-P loops by reconnecting nutrient & carbon flows between conventional agro-pillars through agro-processing.

## The Nutri2Cycle Project:

- Benchmarked existing N-P-C flows
- Proposed & tested innovative technologies at local level
- Validated (prototype lighthouse demo's)
- Identified the effect of these innovations at EU scale

# Teagasc Nutri2Cycle Lighthouse Demo:

The lighthouse demo managed by Teagasc aimed to displace chemical fertiliser needs for both croplands and grasslands by incorporating bio-based fertilisers (BBFs) into the sites nutrient management plans (NMP). The term bio-based fertilisers refers to fertiliser products that are originally derived from living organisms, either directly i.e. animal manures, or, indirectly i.e. by-products of food processing. Of particular focus was the BBFs ability to supply phosphorous (P).

Within the trial a variety of BBFs were used including cattle slurry (A), poultry manure (B), pig slurry solids (C), calcium precipitated dairy processing sludge (Ca-DPS) (D), aluminum precipitated dairy processing sludge (Al-DPS) (E), potato wastewater struvite (PWStruvite), municipal wastewater struvite (MWStruvite) (F), poultry litter ash (PLash) and sewage sludge ash (SSAsh) (G). Average nutrient values of the trialled treatments can be found in the table below.

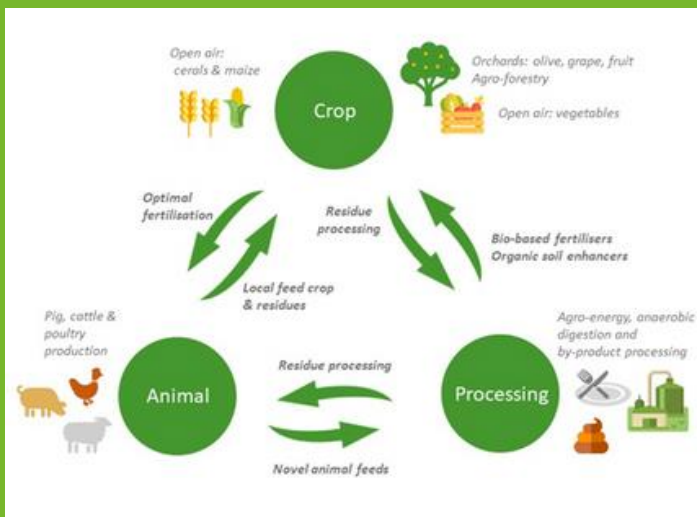


Above: aerial view of cropland trial site; below: aerial view of grassland trial site



Bio-Based Fertiliser	pH	DM %	kg/tonne fresh weight			
			N	P	K	S
Cattle Slurry	7.5	8	3.5	0.6	3.9	0.4
Poultry Manure	7.5	85	30.7	10	17.4	6
Pig Slurry Solids	12.6	78	1.7	19.1	77.3	8.2
Ca-DPS	7.4	24	5.3	23.8	1.2	0.7
Al-DPS	7	10	6.1	4.9	1.6	0.6
PWStruvite	8.7	58	29.8	62.2	6.9	0
MWStruvite	8	51	26	51.5	0.3	0
PLash	12	100	0.17	55.1	106.6	30.6
SSAsh	10	100	0.27	83.9	12.6	29.7

Over the duration of the trial, DPS, struvite & ash treatments provided all of their respective crop and/or grass P needs; cattle slurry, poultry manure & pig slurry solids provided between 44 - 100%, 46 - 100% and 63 - 100% of the crops/grass P needs.



NUTRI2CYCLE brings together the extensive expertise of leading experts in the field of nutrient cycling from 19 organisations across 12 EU countries.