



# Nutrient Management and Nutrient Recovery Thematic Network

General presentation of the fertilizers used in the demonstration trials in Italy

Prof. Massimo Pugliese

University of Torino - Agroinnova

Friday 11<sup>th</sup> June 2021



# The BioPhosphate (ID:192)



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**ID 192:**

<https://www.agrocarbon.com>



**Country:** Hungary, produced by 3R-Biophosphate Ltd.

**Input material:** food grade animal bone

**Nutrient content:** >30% P<sub>2</sub>O<sub>5</sub> + >38% CaO.

**Recommended crops:** horticultural, fruits, grape, rice, tobacco.

**Dosages:** 0.2-1.5 t/ha.

**Type of farming:** conventional, low input, organic



# The BioPhosphate (ID:192)



**ID 192:**

<https://www.agrocarbon.com>



**Benefits:**

- High nutrient density**
- Increase the macroporosity of the soil**
- Natural/organic**
- BIO-NPK-C formulation competitive on the market and economics**



# Calcium Sodium Phosphate (ID:397)



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**ID 397:**

<https://www.outotec.com>

**Country:** Germany, produced by Outotec GmbH & Co. KG

**Input material:** Sewage sludge ash, sewage sludge

**Nutrient content:** (N-P-K %): 0% N – (15-25)% P<sub>2</sub>O<sub>5</sub> – 1% K<sub>2</sub>O

**Recommended crops:** all

**Dosages:** depending on P-nutrient needs of the crop and P-status of the soil

**Type of farming:** conventional



# Calcium Sodium Phosphate (ID:397)



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**ID 397:**

<https://www.outotec.com>

## Benefits:

- High content of highly soluble P in neutral ammonium citrate > 80% as calcium-sodium-phosphate
- Not soluble in water
- Reduced risk of runoff, leaching and fixation
- Supply of P on request: release of P only in the presence of exudates from the roots of the crops
- Fertilizer performance comparable to triple superphosphate.



# Struvite 1 (ID:250)



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**ID 250:**

<https://www.cartif.es/en>

**Country:** Spain, produced by Fundacion Cartif

**Input material:** pig manure digestate, magnesium chloride and NaOH

**Nutrient content:** N-P-K %: 5-28-0

**Recommended crops:** permanent grassland, cereals, root crops, plants harvested green from arable land by area

**Dosages:** about 0.14 t/ha

**Type of farming:** conventional



# Struvite 1 (ID:250)



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FARMER PLATFORM

**ID 250:**

<https://www.cartif.es/en>

## Benefits:

- No risk of overdose
- Avoid abrasion of the roots.
- High availability.
- Provides a constant supply of nutrients.



# Struvite 2 (ID:208)



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**ID 208:**

<https://www.dam-aguas.es>



**Country:** Spain, produced by DAM

**Input material:** wastewater sewage

**Nutrient content:** 5 N%, 29 P<sub>2</sub>O<sub>5</sub>%, <1,0 K<sub>2</sub>O%

**Crops:** cereals, wheat and spelt, barley, oats and spring cereal, grain, maize

**Dosages:** 1'170 kg/ha for potato, 921 kg/ha for wheat

**Type of farming:** low input



# Struvite 2 (ID:208)



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FARMER PLATFORM

**ID 208:**

<https://www.dam-aguas.es>

## Benefits:

- No risk of overdose
- Avoid abrasion of the roots.
- High availability.
- Provides a constant supply of nutrients.



# Compost (ID:210)



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**ID 210:**

<http://ambiente.aceapinerolese.it>

**Country:** Italy, produced by ACEA Pinerolese

**Input material:** de-hydrated effluent from the anaerobic digestion of organic fraction of municipal solid waste, green residue from separate urban collection and dehydrated effluent from the wastewater treatment plant.

**Nutrient content:** 2.4% N (d.m.), 2.3% P<sub>2</sub>O<sub>5</sub> (d.m.), 1.3% K (d.m.)

**Crops:** potato, wheat, cabbage, pumpkin, cucumber, tomato, leafy vegetables, celery, leek and other crops – horticulture, floriculture, arboriculture.



# Compost (ID:210)



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FARMER PLATFORM

**Dosages:** 10-30 t/ha (according to soil quality, season, crop uptake, ...)

**Type of farming:** conventional

**Benefits:**

- Produced from selectively recovered pre-digested organic waste streams
- Closing material and nutrient cycle: safe source of carbon, nitrogen, phosphorus and other macro/microelements
- Improves soil biodiversity by increasing microbiological fauna and flora
- Slow release of nutrients
- The anaerobic digestion process allows the production of biomethane.

**ID 210:**

<http://ambiente.aceapinerolese.it>



# Green compost (ID:280)



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FARMER PLATFORM

**Country:** Belgium, produced by IMOG

**Input material:** Green waste (compostable, organic waste from gardens, parks, lawns and road sides; conformity with Vlarema)

**Nutrient content:** 1.22-1.62% N% (d.m.), 0.45-0.61% P<sub>2</sub>O<sub>5</sub> % (d.m.), 0.87-1.26 K<sub>2</sub>O% (d.m.)

**Crops:** potato, wheat, cabbage, pumpkin, cucumber, tomato, leafy vegetables, celery, leek and other crops – horticulture, floriculture, arboriculture.

**Dosages:** 20-25 t/ha (depending on soil, season, crop,...)

**ID 280:**

<https://www.imog.be>



# Green compost (ID:280)



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FARMER PLATFORM

## ID 280:

<https://www.imog.be>

### Type of farming:

Conventional and organic

### Benefits:

- It is a multi-nutrient, high-carbon soil improver that supports soil fertility,
- Controlled release of nutrients, thus reducing the risk of leaching
- It is a stabilized and sanitized final product.



# Dried Digestate (ID:270)



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## ID 270:

<https://www.facebook.com/arbiovbba/>

**Country:** Belgium, produced by Arbio Bvba

**Input material:** mix of manure and organic waste

**Nutrient content:** 5.9 N% (d.m.) 3% P<sub>2</sub>O<sub>5</sub> (d.m.)

**Crops:** fresh vegetables and strawberry, potato, sugar beet, fresh vegetables, grapes, permanent crops (fruit tree), permanent grassland

**Dosages:** 4 t/ha (depending on soil, season, crop...)

**Type of farming:** conventional, low input.



# Dried Digestate (ID:270)



## ID 270:

<https://www.facebook.com/arbiovbva/>



### Benefits:

- Closing material and nutrient cycle: safe source of carbon, nitrogen, phosphorus and other macro/microelements
- Good N/P ratio
- Improves soil biodiversity
- Dry pelletized: optimized storage and transport and long shelf life





# Nutrient Management and Nutrient Recovery Thematic Network

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[www.nutriman.net](http://www.nutriman.net)



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