

## An innovative approach for sustainable delocalization of manure nitrogen in orchards

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Po valley is a high-density livestock area in Northern Italy (8 million of pigs bred, ~90% of the national pig production). Furthermore, more than 1350 running agricultural anaerobic digestion plants. In some cases, the transfer of manure and digestate to orchard represent an opportunity to utilize local nutrient surpluses.

Technological innovations for a sustainable management have been developed through the Life Agriclose project

## 1) FARM SCALE PROTOTYPE FOR SLURRY ACIDIFICATION WITH SULPHUR BEFORE **MECHANICAL SEPARATION**



83%

Acidification time

Separation time

- Automatic sulphur dosing unit (0.2 - 0.5 kgS/m<sup>3</sup> raw slurry )
- Working capacity: 12-15 m<sup>3</sup>/h
- Energy requirements:
- ~ 1 kWh/m<sup>3</sup> raw slurry
  - 2) DIGESTATE SLURRY SPREADER



Uniformity of distribution (CV <5%)

- ✓ Towed type machine with fixed axle
- ✓ Empty weight: 2.6 tons
- ✓ Capacity: 5 m<sup>3</sup>
- ✓ Atmospheric pressure tank
- ✓ Large section tires
- ✓ Distribution system: 12 sliding
- pipes fed by a volumetric lobe ✓ Variable Rate Application



Uniformity of distribution (CV <5%)

✓ Towed type machine with fixed axle

- ✓ Empty weight: 2.6 tons
- ✓ Hopper capacity: 4.5 m<sup>3</sup>

0.1% S

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Acidified manure (S

0.1%)

13.7 10.7

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🗖 RS

SF

Fraction

Acidified manure (S

0.3%)

0.3% S

🗆 CO2 ed ■ NH3 ■ N20

CH4

5.9

- ✓ Tires (115/80 15)
- ✓ Spinning plate feeding system ✓ Distribution system: 2 belt
- conveyors + 2 rotating sprocketwheels
- ✓ Variable Rate Application



**Operating principle of the distribution system** 



## LIFE17 ENV/ES/000439

Improvement and disclosure of efficient techniques for manure management towards a circular and sustainable agriculture



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0.08

0.06

0.04