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A COMPLETE TREATMENT SCHEME TO REDUCE THE NUTRIENT LOAD OF PIG SLURRY

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Manure surpluses in pig farms can be reduced by means of different slurry treatments. The most common is the separation of the solid fraction to export it to long-distance areas with an high demand for fertilizers. To further reduce nitrogen surplus, an aerobic treatment of the liquid fraction resulting from the solid separation can be adopted.

In all the approaches, however, there remains a need for land application following the treatment, even if pollution potential has been reduced. In many cases a complete scheme of manure treatment is needed. One of these schemes is under development in Lombardy Region (Italy) and will be realized at demonstration scale.

The objective of our monitoring programme is to collect data concerning efficiency of the system, applicability in real scale, gas emissions, hygienic aspects and economics.

The treatment scheme consists of the following main elements: an electroflotation unit, followed by a flotation step for the flocks produced. The sludge obtained will be pumped into a low cost anaerobic digestion unit, operating at ambient temperature. Biogas will be collected by a simple plastic cover stored in a plastic balloon and will be fed to a cogenerator. The energy produced will be used to sustain all the treatment system.

The clarified liquid, greatly depleted in nutrient, is fed to an aerobic purification plant where, as a result of nitrification and de-nitrification, most of the nitrogen is converted into di-nitrogen gas (N₂). To achieve this result, the addition of organic materials, like cheese factory wastes to adjust the C:N ratio, will be practised.

The aerobic treatment results in a dilute effluent that can be discharged to the sewer system or applied at high rates to the cultivated land.

Data on the performance of the single sections of the complete treatment scheme, already collected in real scale situations where existing treatment units are currently in use, will be presented.