Manure use and processing in West-Flanders

A tour on farms and manure processing plants on the 23th of March 2016

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Visited farms and sites:

- **Guido Lammerant, Koksijde**
  - Arable farmer, uses manure from neighbouring farms
  - Has developed a machine to apply ammoniumsulphate from acid scrubbers to potato fields

- **Jeroen Hindrickx, Koekelare**
  - Pig and milk production
  - Has developed an adapted spraying device to apply ammoniumsulphate from acid scrubbers on wheat and grass

- **Wyseur-Lesage**
  - Manure treatment plant
  - Separation of pig manure, biological treatment of the liquid phase
  - Hygienisation of the thick fraction by means of biothermal drying, export to France

- **Jan and Jeroen Roose**
  - Farm with air scrubber and biological treatment
  - Manure treatment plant with capacity of 60 000 m3 slurry
Farm of Guido Lammerant

- Total area 160 ha: potato 50 ha + wheat, barley, sugarbeat (corn if the sowing of winterwheat is not possible)
- Using pig and cow manure from neighbouring farms, 25 m³/ha
- Using ammoniumsulphate (N 5 %) from neighbouring pig farm, where the airscubbing of ammonia is obligatory
- Using a mixture of ammoniumsulphate and liquid N-fertilizer Urean (N 39 %) for potatoes
- Has developed a machine for very exact applying of the mixture of liquid fertilizers
• Lammerant takes slurry from two neighbouring farms

• Neighbouring farms pay Lammerant 100 – 150 € / ha for taking 25 m³ slurry/ha

• Lammerant takes always a manure sample from the slurry he gets, to know the quality of the slurry (value of nutrients /m³) and to be able to plan the fertilization as a whole
The machinery to apply mixture of liquid fertilizers for potatoes.
The machine and the inventor
• For transporting and storing the ammoniumsulphate, Lammerant has built a tank from old milk tank
• Farm has got ISO 14001 certification
• As part of the certification, he uses nutrients from local sources, such as manure
• Use of ammoniumsulphate for potatoes, every fourth year of the crop circulation
• The amount of sulphur (S) coming with ammoniumsulphate is enough for the whole crop circulation
Slurry is applied by a contractor, who uses Schouten drag-hose injector. Use of this technology is important to Lammerant, as the soil has a relatively high clay content and thus there is a risk for soil compaction.
Contractor
Leuridan Agro Logistics

- Manure spreading and several other services
- Slurry spreading with injectors and drag hose system
- Using a container + four tractors to transport the slurry to the field
- Has got three Schoudan drag hose systems
- Has designed and built a special container which is divided in two sections
- Possible to mix e.g. cow and pig slurry or thin fraction and slurry to get a certain nutrient content in the slurry applied to field
Farm of Jeroen Hindrickx

- 200 sows, 2000 fattening pigs, 25 cows
- 50 ha field area: 27 ha spinach, 17 ha corn, 7 ha potatoes, 2 ha wheat
- New pig stables built 2010
- Air-scrubbing obligatory in the environmental permit
- Cost of the air-scrubbing investment 50-60 000 € + appliance
- Using a chemical air-scrubbing system, where ammonia is stripped from air with the use of sulphuric acid
- The yearly production of ammoniumsulphate is 90 m3
• The yearly usage of sulphuric acid on the farm is 9 m³
• The acid is brought to the farm 3 times a year and stored in a 3 m³ tank
• Today sulphuric acid is considered to be too dangerous to be stored on a farm, so the obligatory air-cleaning systems allowed on farms is now either biological or combination of biological and chemical cleaning
• The ammoniumsulphate is applied using a spraying system
• Ammoniumsulphate is applied on wheat and grass
• To avoid the risk of leaf burning, the ammoniumsulphate can only be applied on growing plants during rain
• Hindrickx sells contractor services applying ammonium sulphate on four other farms also, as there are lots of pig stalls in the area producing ammoniumsulphate in their air-cleaning systems
• The amount applied is 1200 l/ha + 25 m3 slurry, which gives approximately 250 kg N/ha
Farm de Krinkel

- Biological manure treatment plant
- First phase built to meet the environmental permit requirements on the own farm
- Manure processing capacity of 20,000 m³, cost 1 milj. €
- Second phase, the build up capacity to 60,000 m³, cost 0,5 milj. €
The biological treatment consists of three phases
1) Separation of the slurry with a centrifuge
2) Removal of nitrogen from the liquid fraction by using biological nitrification-denitrification process
3) Hygienisation of the solid fraction (done by a separate company)

The remaining liquid fraction with very little nitrogen and phosphorus can be applied to the fields (300 m³/ha vs. 25 m³/ha untreated slurry
There are several pig stalls close to each other. The slurry is transported to the treatment plant using underground pipes. In the picture on the left is also the biological-chemical air-scrubber. All the roofs of the pig stalls are covered with solar panels. The farmers rent their roof area to a company producing and selling electricity.
After the biological treatment, the liquid fraction is stored in a 25 000 m³ lagoon.
Manure processing plant
Wyseur Lesage

- Buying dry poultry manure and taking separated solid fraction of pig manure and digestate (gate fee 20 €/m³)
- Total usage of dry manure and dry fractions is 45 000 m³/year
The mixture of different dry manure is treated thermally (70 C) to make the use of the compost safe
• After the thermal treatment, the compost is stored
• The compost is sold to France, to be used as fertilizer and organic matter soil improver on arable farms and wine yards
• The price of the compost is 20 – 25 €/tn, including the freight
7000 loads of manure and compost is being transported to the treatment plant each year
Air cleaning systems (ammoniac washers) are mandatory also to a manure treatment plant. Bio-Armor has both chemical and biological air cleaners.

On the left a biobed, a unit to reduce odors from the treatment plant. Wood chops is used as a filter material. On the right a new biobed is under construction. The air is brought to the biobed through the holes in the floor.
Separated liquid fraction is being treated biologically using the nitrification-denitrification process.
The nearby pig stall is being constructed using a system that separates the urine already in the pig stall. There are less than ten pig stalls using this system in Flanders. The system is good, but more expensive to build than the slurry manure system. It can not be installed in existing pig stalls. The dry manure is taken to a biogas plant. The urine is being treated in the nitrification-denitrification process.
Thank You!

• A very warm thank to the farmers who were willing to give their precious time during the spring season, to tell us about the use of manure and the manure processing on their farms

• A very warm thank also to the personnel of Voeders Decadt, for the visit on the manure treatment plant

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