

# Fact sheet: Farmer perceptions and use of organic waste products as fertilisers – a survey study of potential benefits and barriers in Denmark



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## Summary

The EU Nitrates Directive has since the beginning of the 1990ies stipulated how national regulations should cap animal manure application to land at max. 170 kg N/ha, preventing manure overload to land and groundwater pollution. In Denmark this has been implemented through the so-called Harmony-regulation and Danish farmers are reasonably familiar with exchanging manure from livestock farms to arable farms.



However, currently there is increased focus on developing a circular economy and enhancing societal resource efficiency. As a consequence, processing and recycling of other societal organic waste to improve its value when used as agricultural fertilisers can be expected to increase. However, there is a lack of understanding of farmer's decision-making regarding the use of processed and unprocessed organic waste-based fertilisers.

Such knowledge is important to guide future policies on waste management and on the development of industries for processing of organic wastes from agriculture, industry and households.

We therefore conducted a survey asking farmers in Denmark about their current use of organic fertiliser, their interest in using alternative types in the future, and their perception of most important barriers or advantages to using organic fertilisers.



## How did we survey farmer practices and perceptions

We designed a survey questionnaire with 24 questions, taking approximately 10 minutes to complete. Participants in the survey were selected from the public 2011 Danish Fertiliser Accounts Registry, and 1 585 farmers, representative of the entire farm population (43 000), were sent the questionnaire by post.

**Table 1.** Types of organic fertilisers considered in the survey.  
AD = Anaerobically-digested, TD = thermally-dried

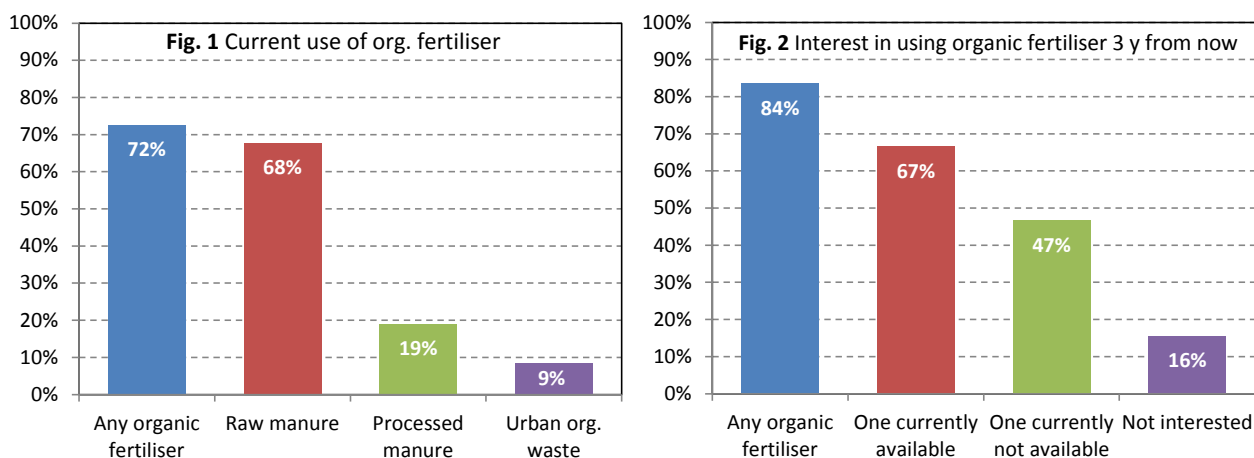
Raw manure	Process manure	Urban organic waste
Slurry (cattle/pig)	Mech. separated slurry (solid /liquid)	Biocompost (municipal org. waste)
Urine	AD manure/slurry	Raw/dewatered sewage sludge
Solid manure/ FYM/deep lit.	Composted or TD manure/slurry	Processed sewage sludge (composted, AD or TD)
	Acidified slurry	Mineral concentrates and precipitates (e.g. struvite)

Farmers were asked about their attitudes towards a number of organic fertilisers (see Table 1 for types).

They were asked about their current use of these fertilisers, their interest in their use three years from now, the barriers to using organic fertilisers, and also the most important advantages or reasons for them to be using organic fertilisers.

452 filled questionnaires were received back (28% response rate), and these were checked to be representative of the whole farm population (wrt. geography, farm typology and livestock intensity).

## Current use and future interest in organic fertilisers



Almost three quarter (72%) of the farmers currently used at least one type of organic fertiliser (Fig. 1); this indicates that many non-livestock farmers have experience with receiving manure, as less than 40% of the farms have livestock of their own. Most farms (67%) used a raw, unprocessed manure, while 19% used a processed manure and only 9% used an urban organic waste fertiliser. Organic fertiliser use increased with farm size; 60% of farms sized 10-20 ha used organic fertiliser compared to 85% of farms with >100 ha. There was an even larger interest for future use of organic fertilisers (Fig. 2); as many as 84% were interested in using any organic fertiliser (12% more than current use), but many (47%) were interested in an organic fertiliser not currently available to them, especially processed manure (42%, vs. 19% current use) and urban organic waste fertilisers (23%, vs. 9% current use). These results points at a very significant, but so far unmet demand for organic fertilisers, and the data indicates that especially younger farmers and certified organic farmers have the highest unmet demand.

## Barriers and advantages for use of organic fertilisers

Farmers were also asked to rank their perceptions of the top three most important barriers as well as advantages/reasons for their use of organic fertilisers (Table 2). Odour nuisance for neighbours was ranked as the most important barrier for organic fertiliser use, followed by uncertainty in NPK content and larger difficulties in planning the use of organic fertilisers, due to uncertainty of nutrient content and availability.

Barriers to organic fertilisers	Advantages or reasons for using organic fertilisers
1 <sup>st</sup> Odour nuisance	1 <sup>st</sup> Organic fertiliser improves soil structure
2 <sup>nd</sup> Uncertainty in NPK content	2 <sup>nd</sup> Low cost to buy/produce (e.g. own manure)
3 <sup>rd</sup> More difficult to plan use of organic fertiliser than mineral fertiliser	3 <sup>rd</sup> The organic fertiliser is easily available (e.g. from a neighbouring livestock farm)

**Table 2** Ranking of perceived barriers and advantages for organic fertiliser use

Farmers appear to really appreciate the improvement of soil structure achieved by organic fertilisers as this was by the far highest overall ranked advantage, followed by low cost and ease of availability.

**In conclusion, a very large proportion of Danish farmers have significant current experience with and even higher future interest in using organic waste-based fertilisers, of both agricultural, urban and industrial origin. This points at a large potential for waste managers and processing industry to deliver new recycled fertiliser products - but quality issues and price will be key factors for success!**

### More information

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