

99% removal of microplastics in an ordinary WWTP

Svenskt Vatten, Anders Finnson

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Introduction of two projects - microplastics in wastewater

- These two Swedish projects were aimed to create an overview and increased understanding of the flow of microplastics in the wastewater management cycle.
- The fractions included in the projects were: influent and effluent wastewater, sewage sludge, digestate from anaerobic digestion - and for one of the projects also soil fertilized with sludge
- For the soil, sludge and digestate factions, method development was included measuring microplastics in **mg/l water** and **mg/kg dry matter sludge**

Project 1: Malmö, Sjölunda WWTP, 300 000 pe

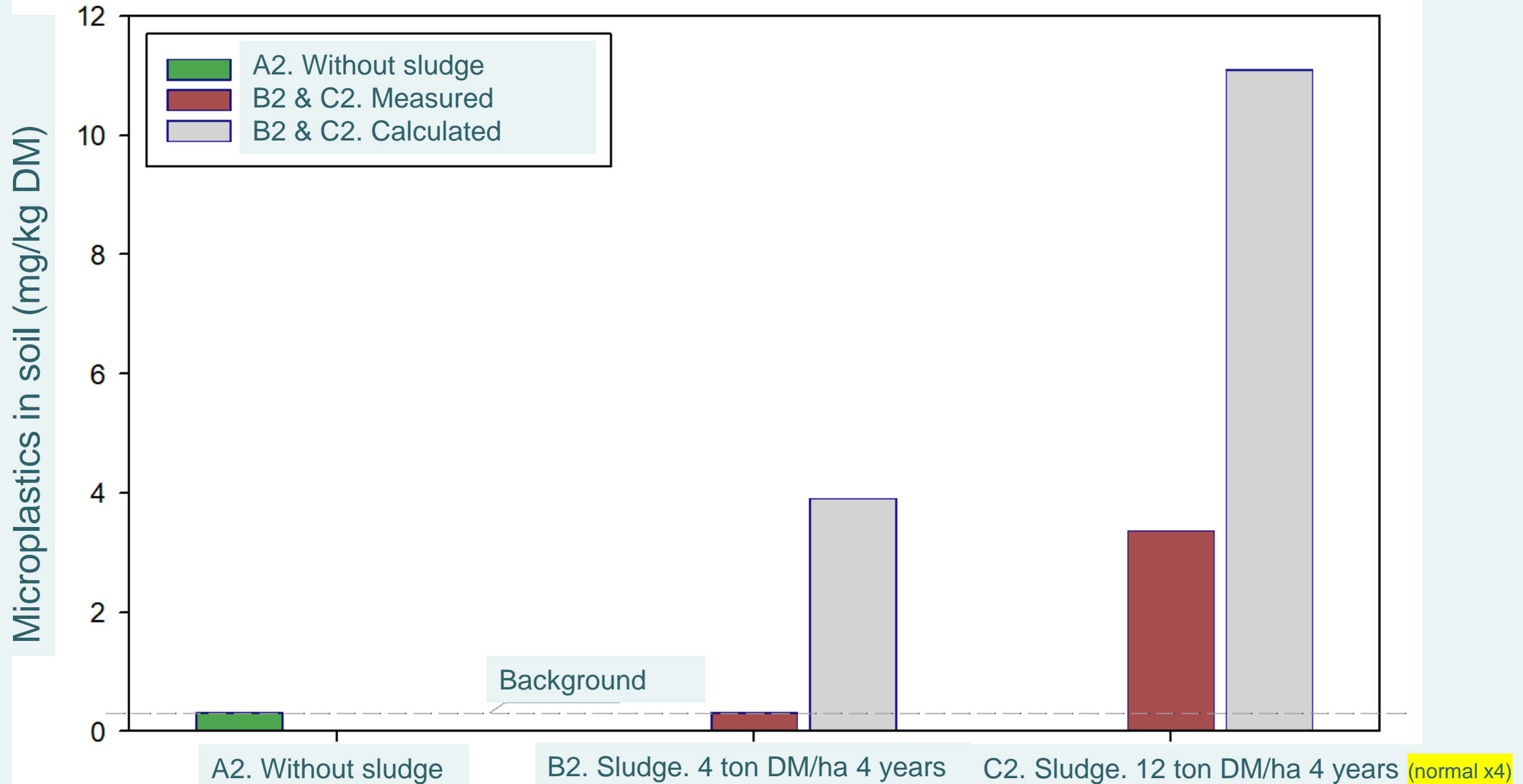
More than 99% of the microplastics (10-500 μm) were removed from the incoming wastewater. (High rate of removal of particles due to appr. 95% removal of P)

Total discharge of microplastics was calculated to 0,15 g/(PE year).



40% of the microplastics in the incoming wastewater were found in the anaerobically digested sludge.

Arable land, Petersburg after 35 years of sludge use



Project 2: Göteborg (Rya WWTP) and Stockholm

- Domestic wastewater in Stockholm and in Gothenburg, contains 3-10 g/pe year
- Microplastics in the influent wastewater to Rya WWTP:
 - 30 % originates from domestic wastewater
 - 70 % originates from stormwater and other sources.

This study indicates:

- a load to WWTPs of 1.2 g tyre particles/person and year.
- the microplastic load direct from stormwater to water recipients are 100 times greater than of WWTP effluents.

Conclusions

- The WWTPs are highly effective in retaining microplastics with 99% removal
- Microplastic pathways to water recipients from stormwater is 100 times greater than from effluent wastewater.
- Only 40-60% of the microplastics in the incoming wastewater were found in the anaerobically digested sludge. The rest of the microplastics have been removed or disintegrated/degraded during the treatment in an ordinary WWTP.
- The concentration of microplastics in sludge from Rya WWTP, Käppala WWTP and Sjölunda WWTP, corresponds to 5, 8 and 8 g/pe, year respectively.
- Sludge (normal dose) used as fertilizer for 35 years seems not to cause an elevated microplastic concentration in the soil
- Data indicate that the microplastics might be disintegrated/degraded in the soil
- Additional removal requirements at WWTP are not sustainable, but more source control is needed e.g. microplastics in storm water were extended producers responsibility (EPR) should be applied.
- Read more about microplastic and the waste water sector:
 - [Project 1: Malmö, Sjölunda WWTP](http://vav.griffel.net/filer/svu-rapport-2018-13.pdf)
<http://vav.griffel.net/filer/svu-rapport-2018-13.pdf> (Summary in English)
 - [Project 2: Göteborg \(Rya WWTP\) and Stockholm](https://www.svensktvatten.se/contentassets/22657293353d44ecaca7721d0b1c907c/svu-rt228.pdf)
<https://www.svensktvatten.se/contentassets/22657293353d44ecaca7721d0b1c907c/svu-rt228.pdf> (Summary in English)
 - <http://www.eureau.org/resources/briefing-notes/3940-briefing-note-on-microplastics-and-the-water-sector/file>



The background of the image is a textured, teal-colored surface that resembles water with ripples and waves. The color is a deep, muted blue-green. The texture is created with various shades of teal, giving it a sense of movement and depth.

Svenskt Vatten