Webinar series spotlight article

# SUSTAINABLE MANURE PRACTICES TO CONSIDER

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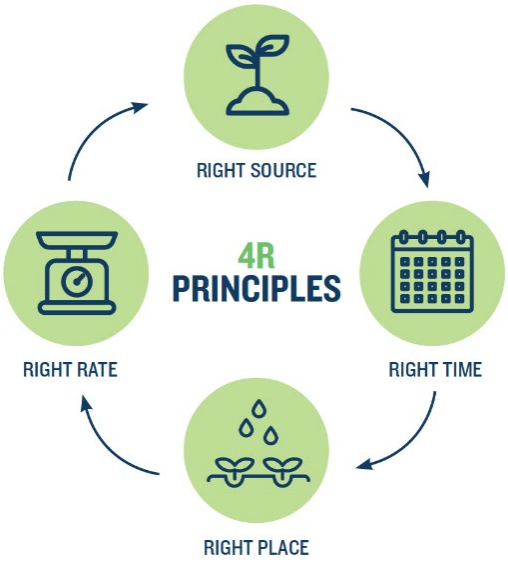
This past March 2024, Lactanet organized a series of 3 sustainability webinars funded by the Dairy Farmers of Canada. Recommended manure management practices were discussed in Webinar 2 and are summarized in this article.

Manure storage is one of the main sources of a dairy production's emissions, contributing about 20% of a farm's carbon footprint. Many practices can, however, be selected to emit less greenhouse gases and therefore increasing efficiency on farm.




The management of manure prior to its application in the field, and particularly its storage, is a source of methane ($CH_4$) and nitrous oxide ($N_2O$), two greenhouse gases (GHG) that contribute significantly to the farm's GHG balance— and therefore the carbon footprint of milk. Manure can also impact air quality because it is a source of ammonia ($NH_3$) and volatile organic compounds. When $N_2O$ and $NH_3$ emissions occur, they represent a loss of nitrogen as they are not returned to the field. Importantly, the use of manure in the field, when respecting the 4Rs (right source, right rate, right place, and right time) is a sustainable practice. It enables the recycling of organic matter, nutrients (N, P, and K), and energy, while also reducing the use of synthetic fertilizers, which have a significant impact on production and distribution of GHGs, non-renewable fossil-fuel energy, and cost.

There are various strategies and technologies available to reduce GHG emissions from manure storage, measured by direct $CH_4$ and $N_2O$ emissions (GIEC, 2019). However, their effectiveness, cost, and return on investment vary.

Implementing manure management strategies that work for you and your farm can not only reduce GHG emissions and improve the sustainability of your farm, but also have financial benefits in the long term. Your farm advisors are your first line of support when making management decisions.

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**Strategies to reduce emissions from manure storage include:**

| Strategy | Benefits and considerations |
|---|---|
| Solid manure storage | • Offers the greatest potential for GHG reduction (if not already used) |
| Composting | • GHG reduction similar to that of solid manure storage<br>• May require additional costs depending on technology used<br>• Additional steps needed to use as animal bedding |
| Anaerobic digestion | • Can be used to generate biogas (biomethane) and electricity, thus creating an additional income<br>• Requires a minimum of investment and precise and careful monitoring of operations, at least until technology advancements occur |
| Liquid manure storage with pit cover | • Has slightly higher direct GHG emissions than solid manure storage<br>• Offers the most cost-effective reduction of GHG emissions (Fournel et al., 2019)<br>• Reduces manure volume and nitrogen losses through ammonia volatilization<br>• Cover can be either a natural crust or physical cover |
| Acidification of slurry | • Can help reduce GHG emissions at a limited additional cost |
| Emptying the pit | • When done as soon as temperatures rise above 15 °C, even if only partially, significantly reduces methane emissions |

**For an assessment tailored to your farm, contact an expert advisor!**

**To watch the full webinar recording please visit:**
https://www.youtube.com/watch?v=W-0GCpgNot4

References
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