

# Best Management practices



*Growing for a better future.*



## NUTRIENT and MANURE Management

Plants need nutrients for their growth. Nutrients come from many agricultural sources such as fertilizers, manure, composts, and crop residues. Manure and fertilizers are also potential sources of nitrous oxide (N<sub>2</sub>O) emissions. Proper nutrient management will reduce N<sub>2</sub>O emissions to the atmosphere mitigating the impact of this greenhouse gas.

The good way to reduce N<sub>2</sub>O emission is to apply just enough fertilizer to allow the crops to reach maximum yield. Achieving that balance is improved by:

- Soil testing
- Manure testing
- Plant analysis
- Using recommended rates of nutrients based on soil test results
- Accounting for the nutrients that legumes and manure can provide to the soil
- Applying fertilizer at different rates within a field (precision farming)

These management practices which promote proper nutrient uptake by the plants prevents nutrient loss and minimize potential leaching to nearby watercourses. Improved fertilizer use efficiency may also increase plant production, which could aid in sequestering carbon.

Manure is a valuable source of nutrients, but it is also a source of methane and nitrous oxide. Proper manure storage and handling retains nutrients for crops and decreases GHG emissions. It also provides other benefits like odour reduction and better resource efficiency.

Some BMPs producers can use to reduce greenhouse gases from manure:

- Apply manure to the land as soon as possible and incorporate as soon as possible.
- Compost manure or minimize manure storage time.
- Eliminate or minimize winter spreading of manure.

Methane can also be used as an alternative fuel source. While not practiced widely in Canada yet it may be useful to capture, store and burn methane as a way of replacing traditional fuels. This would be another way of reducing greenhouse gas emissions from fossil fuel sources.

While manure itself is a source of greenhouse gases, producers can also adopt livestock BMPs to control greenhouse gases. For example, methane emissions from beef cattle can be reduced by:

- **Feeding higher quality feeds and balanced rations such as:** high grain diets; ensiled rather than dried forages; and protein and mineral supplements.
- **Feeding ionophores:** Ionophores are common feed additives that reduce methane formation by rumen bacteria.
- **Feeding lipids:** Plant-derived edible oils, like canola oil, added to cattle feed not only add energy to the diet but also inhibit methane production.
- **Adding bacterial supplements to feed:** Bacterial supplements may be able to convert methane in the rumen to carbon dioxide and may also improve digestion of feed.



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