



Best management practices and greenhouse gases (GHG)



Greenhouse gases in agriculture

The principal greenhouse gases (GHG) produced by man are :

- CO₂ (carbon dioxide)
- N₂O (nitrous oxide)
- CH₄ (methane)

Agricultural practices that help attenuate GHG emissions are basically the same as those brought forward to improve the quality of water and soil. They focus on greater efficiency in soil management, organic and inorganic fertilizers and the feed rations used in animal production. These practices can therefore contribute to improving the profitability of agricultural enterprises.

The management of nutrients and soils

Best nutrients management practices

- Avoid excessive doses of fertilizer and/or manure in solid or liquid form
- Time applications with crop requirements (divided instead of single applications)
- Avoid ammonium and nitrate losses into the environment
- Plant cover crops (green manure, inter-seeded crops)
- Improve soil drainage

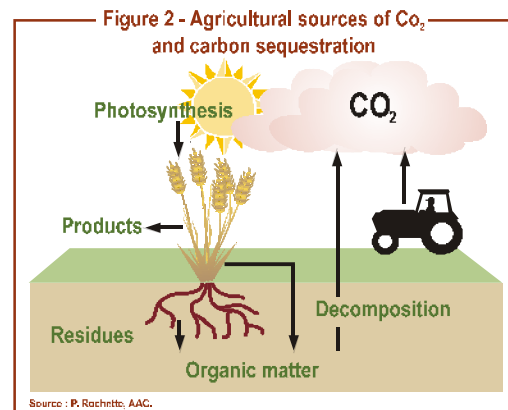
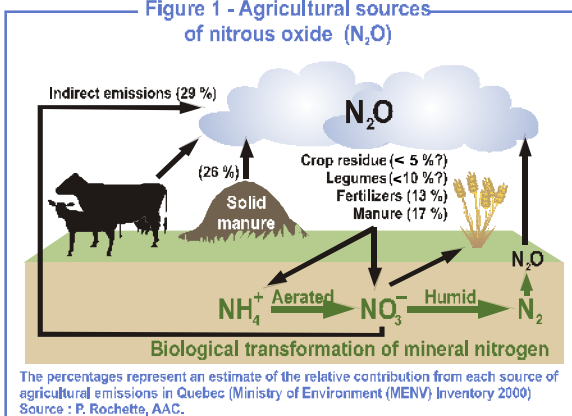


Figure 1 - Agricultural sources of nitrous oxide (N₂O)



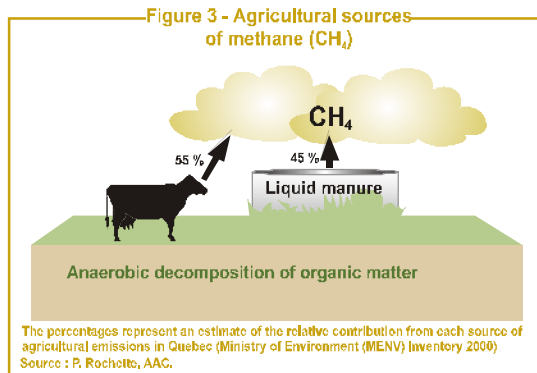
In order to diminish the N₂O produced in soils, nitrates must not be allowed to accumulate and soils should be well oxygenated.

Practices which aim at increasing levels of organic matter (manure, crop residue) or diminishing its rate of decomposition allow atmospheric CO₂ to be captured.

Best soil management practices

- Increase the return of crop residue to the soil
- Properly manage organic soil improvements (manure or others)
- Reduce working the soil (reduces the speed of decomposition of organic matter)
- Improve the management of meadows and pasture for increased plant production
- Increase the amount of perennial crops in the rotation
- Establish windbreaks (hedges)

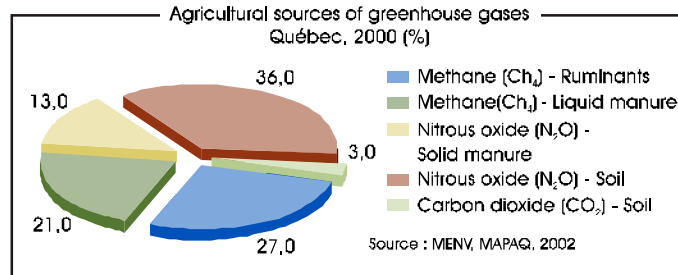
Management of herds and storage buildings



Methane (CH₄) is produced by fermentation in the digestive systems of ruminants, and by solids deposited at the bottom of manure pits.

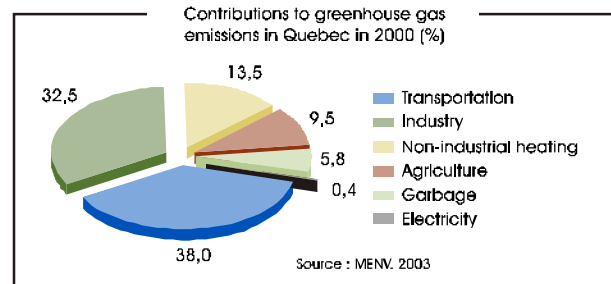
Some statistics ...

Agriculture, with approximately 10% of total emissions, produces less GHGs than several other economic sectors, such as industry and transportation.



Best management practices

- Improve livestock productivity through:
 - ✓ Better genetics
 - ✓ Better digestibility of feed
 - ✓ Increased reproductive rates
 - ✓ Lower incidences of disease
- Improve the management of liquid manure storage through:
 - ✓ Separation of the solids from the liquid before storage
 - ✓ Reduction in the quantity of bedding
 - ✓ Improvement of feed conversion
 - ✓ Storage in a partially ploughed in (lower temperature) pit
 - ✓ Shortening of the storage period



One of the particularities of agriculture is the proportion of different gases produced. The adjacent figure shows the contribution of different agricultural sources to greenhouse gas emissions.

Summary of management practices which aim at reducing greenhouse gases

Sectors	Best management practices	N ₂ O	CH ₄	CO ₂
Crop production	<ul style="list-style-type: none"> - Optimize quantity of nitrogen added to the crop at the time it is most needed (quantity, timing and method of application of fertilizers and solid and liquid manure) - Reduce the working of the soil and adopt soil conservation practices - Increase perennial crops in the rotation 	0		0
Animal production	<ul style="list-style-type: none"> - Lower enteric fermentation by increasing production efficiency (genetics, reproduction, nutrition, diseases) - Reduce escaping gases during solid and liquid manure storage 	0	0	