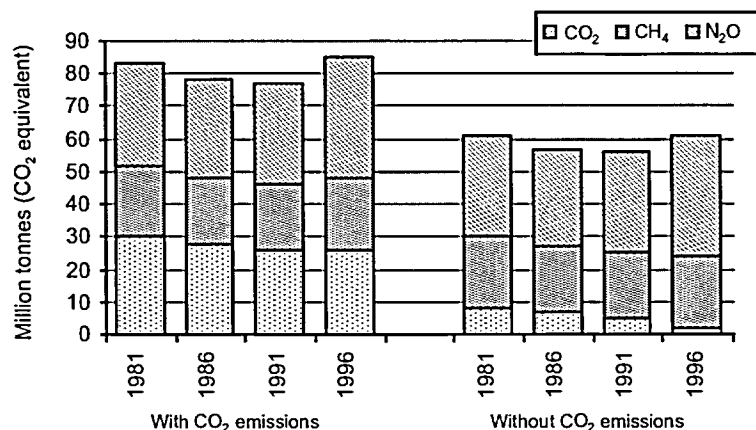


### Greenhouse gas emissions from Canadian agroecosystems, with and without carbon dioxide emissions from on-farm fossil fuel use and indirect sources



Deplete the Ozone Layer. Along with other developed countries that are signatory to the Montreal Protocol, Canada must completely phase out the consumption of methyl bromide by 2005. Cooperative research and demonstration projects between government and industry have already reduced the use of methyl bromide in Canada by about 40 percent. Some alternatives to methyl bromide have been identified, including different chemicals and methods. For example, a guideline has been prepared to encourage the use of integrated pest management, combining preventative and treatment practices, to control pest problems in food-processing facilities.

Agricultural emissions of ammonia and particulate matter are being linked to various environmental effects, such as acidification, eutrophication, and smog. About 80 percent of ammonia emissions from Canadian farms come from animal manure; most of the rest is released from applied fertilizer. Agriculture is thought to be a significant source of airborne particles, or particulate matter, in rural areas. Coarser, primary particles come from the dust released during land tillage and wind erosion of soil. Dust from agricultural lands can be reduced by growing shelterbelts, maintaining soil cover, and minimizing tillage. Agricultural ammonia is also a precursor of smaller, secondary particulate matter. Ammonia emissions can be reduced by appropriate manure handling and storage, animal feed composition, and fertilizer application.

### Agroecosystem Biodiversity

Recognizing that the earth's biodiversity is a resource needing conservation, Canada joined with many other nations in signing the

### Alternatives to Methyl Bromide in Ship Holds

*The Canadian Industry/Government Working Group on Methyl Bromide Alternatives examined alternatives to the current method of methyl bromide fumigation of empty ship holds, often used to transport agricultural commodities such as grain. Vials containing adults and eggs of a variety of insect pests were placed in each of three ship holds. The insects were then subjected to methyl bromide fumigation followed by recapture of the methyl bromide, fumigation by phosphine from cylinders, or controlled generation of phosphine. Results showed that all three methods can be used to limit methyl bromide emissions during ship hold fumigations. Both phosphine treatments killed 100 percent of the eggs and adult insects within 72 hours. The methyl bromide recapture technique captured about 85 percent of the methyl bromide used. The advantages of this method include re-use of the captured methyl bromide and reduced risk to human health in the vicinity of the fumigation site.*