**Best management practices for reducing greenhouse gas emissions from dairy farms**

Dairy farmers can minimise greenhouse gas losses by improving the overall efficiency of their current system; this is entirely consistent with all current best management practices available for increasing milk production efficiency.

**Methane**

Methane is a very high form of energy; thus, any loss of methane from dairy cows represents a loss in potential production. As a rule, methane emissions are reduced as digestibility and the protein/energy balance of the diet is improved.

**Feed your cows well**

Offering higher quality pasture (ie Ryegrass rather than Setaria or Paspalum) will result in higher milk production and more methane per cow, but less methane per litre of milk. Adding a low protein, high-energy cereal grain to this diet acidifies the rumen, restricting methane producing rumen microbes further, while producing more milk.

**Feed additives or rumen modifiers**

Until further research is done, it is too early to endorse any specific feed additives or rumen modifiers that could reduce methane. However, it is highly likely that such agents will be commonly available in the near future.

**Nitrous oxide**

The following Best Management Practices were developed to both minimise the environmental impact and optimise the economic response to nitrogen fertiliser:

Sources of soil nitrogen and the loss of nitrous oxide from dairy pasture
Try to avoid excess nitrogen in the soil

- Do you need to apply nitrogen fertiliser? Before each nitrogen application, compare the cost of the extra pasture produced to the cost of other feed options.
- Only apply nitrogen when pasture is actively growing and can utilise the nitrogen.
- Avoid heavy stock numbers on a single paddock when soils are waterlogged, as this will result in significant urinary deposition in a small area, with pugged soils being typically anaerobic thus losing more nitrous oxide.
- Avoid high nitrogen fertiliser rates. Do not apply above 50 to 60 kg nitrogen/ha in any single application and do not apply nitrogen closer than 21 (30 kg nitrogen/ha in spring) to 28 (50 kg nitrogen/ha) days apart, as this will increase nitrogen losses dramatically.

Nitrous oxide losses are highest on warm and waterlogged soils, so:

- Avoid high nitrogen rates on waterlogged soils, particularly if soil temperatures are above 10°C, as this will increase losses.
- When soils are near field capacity (July to September), avoid applying nitrogen fertiliser before heavy rainfall and for at least two to five days after heavy rains depending on how readily the soils drain. If nitrogen must be applied, then apply lighter rates of nitrogen.

Avoid applying nitrate sources of nitrogen to wet soils

- Currently, the cheapest straight source of nitrogen is urea and DAP is the cheapest mixed source of nitrogen. These sources should result in less denitrification and leaching in cold, wet and waterlogged soils.

Nitrification inhibitors

- A number of coatings can be applied to nitrogen fertilisers that will eliminate nitrous oxide losses directly from fertiliser. It is likely that these coatings will become common practice in the future. However, these coatings have no effect on losses from legumes and urine.

Need more information?

See our project web site www.nitrogen.landfood.unimelb.edu.au for articles and decision support tools for both nitrogen fertiliser and Greenhouse Accounting.

For general articles on greenhouse issues see the Australian Greenhouse Office web site www.greenhouse.gov.au.

The main source of nitrous oxide on dairy farms is cow urine, but nitrogen fertiliser and legumes contribute significantly.