Sustainable Farming and Environmental Demands

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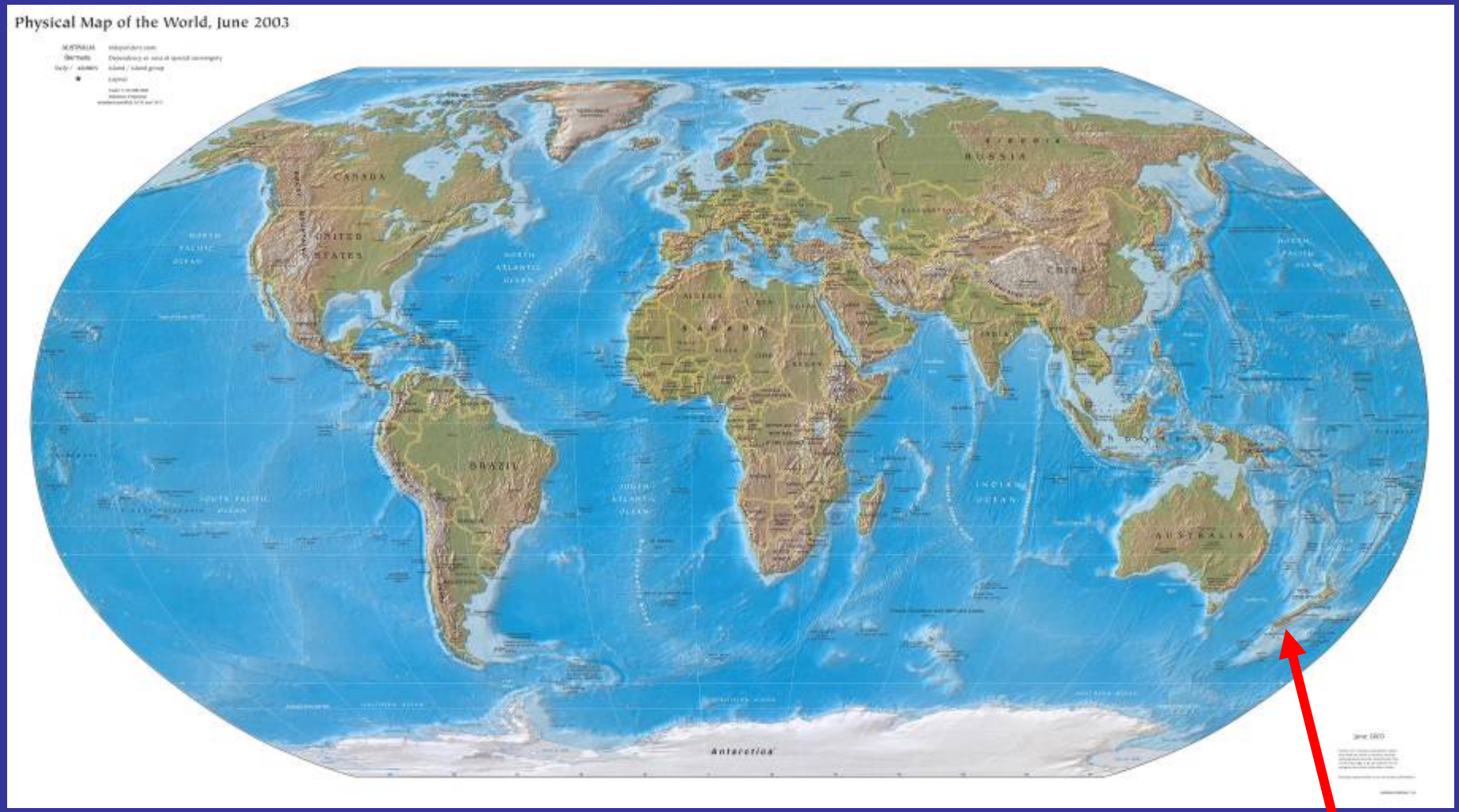
New Zealand Farmer



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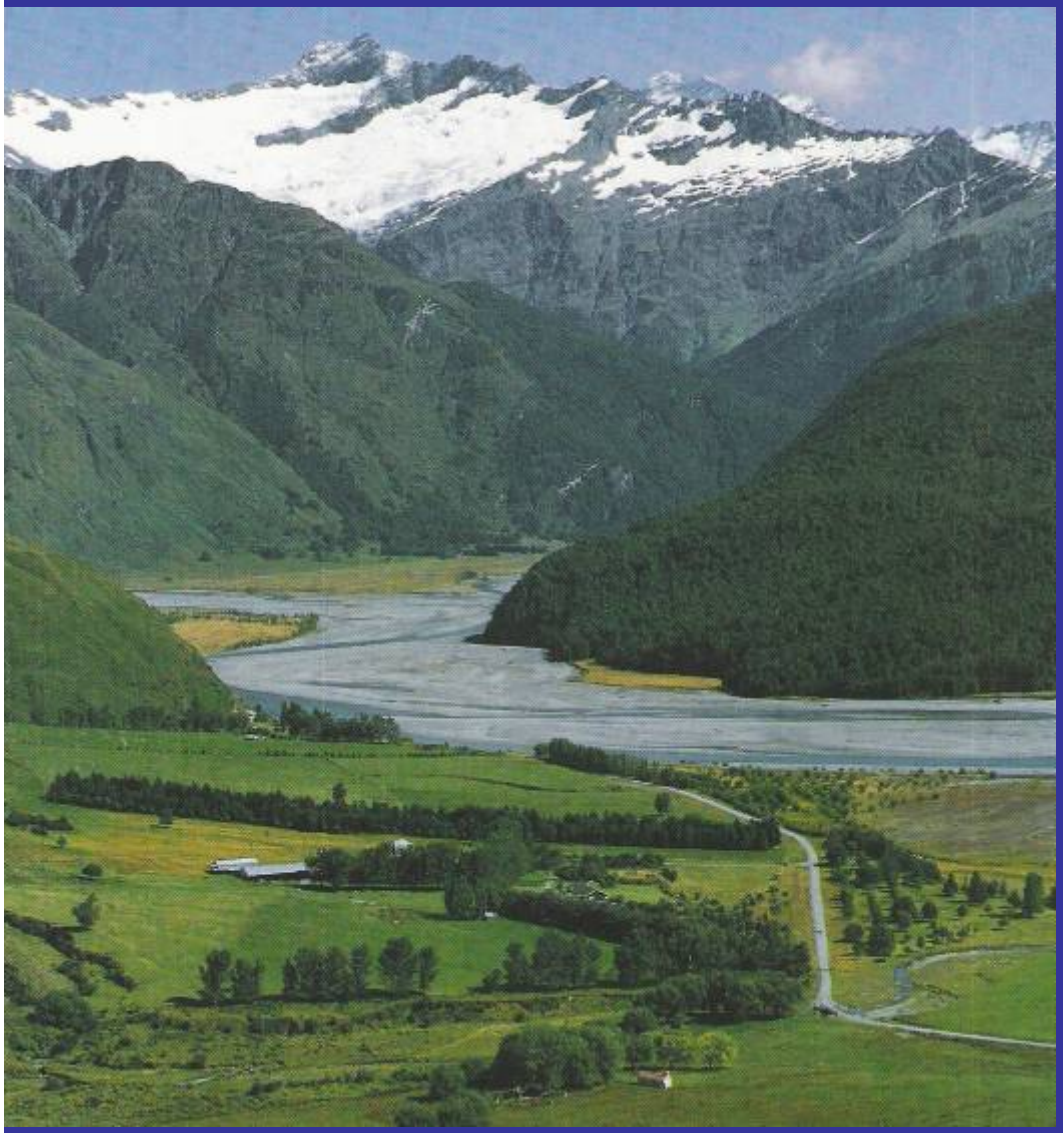
Wanaka, New Zealand



- Third generation farmer
- 10,000ha up to 2,500m altitude
- 3,000ha grazeable
- Graze to 1,300m
- Adjacent to national park
- 80,000 visitors annually

- Run 5,000 sheep
  - Includes 3,600 ewes
  - Producing meat and wool
- 130 red deer breeding weaners for meat
- 20 beehives for clover honey

- Farm 1,150 beef cattle
- Includes 520 cows
- Hereford & Angus cross
- 60% of calves sold at weaning

- Run 320 steers to 4 year old on high and rough ground
- Small heifers finished for local market
- Breed own replacements
- Buy bulls

Environment

- Typical of much of the mountainous and steep hill country in NZ
- Rainfall 1,000 to 4,000mm
- Reliable summer growth but long winters
- However, NZ is a very diverse country
- Rainfall can be 5,000mm in Alps down to 350mm only 80km away
- Best land use varies over short distances

Settlement

- NZ is a small remote island
- Settled by Maori about 1300AD
  - Lived largely on birds, fish and plants
  - Introduced some crops such as kumara
  - Also kiore rat
- Pre human vegetation mainly forest and shrubland to 1,200m
- Much converted to grassland via felling and fire
- Most agricultural land only recently developed
- Only indigenous mammals are bats, but a number of grazing birds

Economy

- Heavily dependent on land and water resources
- Agriculture
  - 17% of GDP
  - 50% of exports
- Export 83% of beef
- 8% of world trade
- Worlds largest exporter of lamb meat (over 50%) and venison (70%)
- Forestry, arable, horticulture, viticulture, fishing and tourism also important

- Best pastoral land
  - Dairy
  - Intensive sheepmeat
  - Beef finishing
  - Arable

Sheep/beef farming

- A typical farm in the medium rainfall hill and high country farms breeding cows and ewes
- Reliable summer growth, so breeding fits growth patterns
- Cattle to maintain herbage quality
- Parasitic worm control
- Diversified income
- Spread workload
- Weed control

- Terrain is often steep and rocky, with gullies and holes
- Hardy, agile, medium sized cattle required
- Can store fat during summer and spend winter outdoors on lower quality feed
- Therefore Hereford and Angus predominate

Markets

- No Government subsidies
- Long distance to markets
- Rely on economies of scale (3,500 to 4,000 SU) per farm
- Low cost efficient farming and service industry
- Target high value niche markets
- Predominately a grass fed system

Biosecurity

- Advantages of remoteness
- Free of Foot & Mouth, BSE, Scrapie, Blue Tongue and many plant diseases & pests
- Reason for very strict border security

Food safety

- High priority
- Statutory declarations with stock for sale
- Codes of welfare (on farm, transport, surgical)
- Low use of antibiotics
- Growth promotants rarely used

Tuberculosis

- Objective to reach OIE target of 0.2% infected herds for Tb freedom by 2013
- Beef, dairy and deer industries and Government combined forces
- National Pest Management Strategy
- Vector management and cattle testing
- Currently at 0.38% infected farms
- Ahead of target
- Possibility to eradicate by 2035

Vectors

- High incidence of TB in feral possums, ferrets, pigs and deer
- Intensive control
- Vectors are also threats to native biodiversity
- Deer hunters oppose

Landcare

- Farmer pride in the land they farm
- Landcare concept embraced
- Groups combine knowledge and resources in projects to enhance common goals
- Voluntary
- Motivation
- Peer pressure

Landcare Trust

- National Trust
- Trustees from Federated Farmers, conservation and recreation groups
- Co-ordination and facilitation

Monitor farms

- Run by industry groups
- Select typical farms with receptive management
- Committee of local farmers

- To implement and demonstrate best farming practice

Legislation

- Resource management governed by Resource Management Act (1991)
- Sustainable management of soil, water, air, landscapes, indigenous flora and fauna for future generations
- Balance environmental, social and economic aspects

Implementation

- 12 regional councils – air, water and soil management
- 64 district councils – land use and biodiversity

Issues

- RMA has focused on indigenous flora and fauna, culture and landscape
- Cost of protection often falls on private landowners
- View towards preservation of indigenous resources rather than sustainable use
- Huge growth in planners/consultants but lack of practical experience

Water

- Huge reserves of fresh quality water
- Much of it remote areas or deep valleys
- Allocation and management in drier regions becoming a major issue
- Future lies in harvest and storage
- Generally adequate in beef breeding areas

Water quality

- Generally good
- Challenge to maintain quality alongside intensive cattle and deer
- Run off of N, P and bacteria
- Streams fenced
- Riparian planting
- Culverts and bridges

Soils

- Our soils are relatively young
- South Island – outwash from rapidly rising Alps along the backbone of the island
- North Island –outwash from volcanic hills or volcanic ash overlaid on mudstones and sandstones
- Erosion has created most of our best soils
- Management of enhanced erosion

Nutrients

- Lime to maintain ph
- Phosphorous, sulphur and potassium key nutrients
- Nitrogen from clover

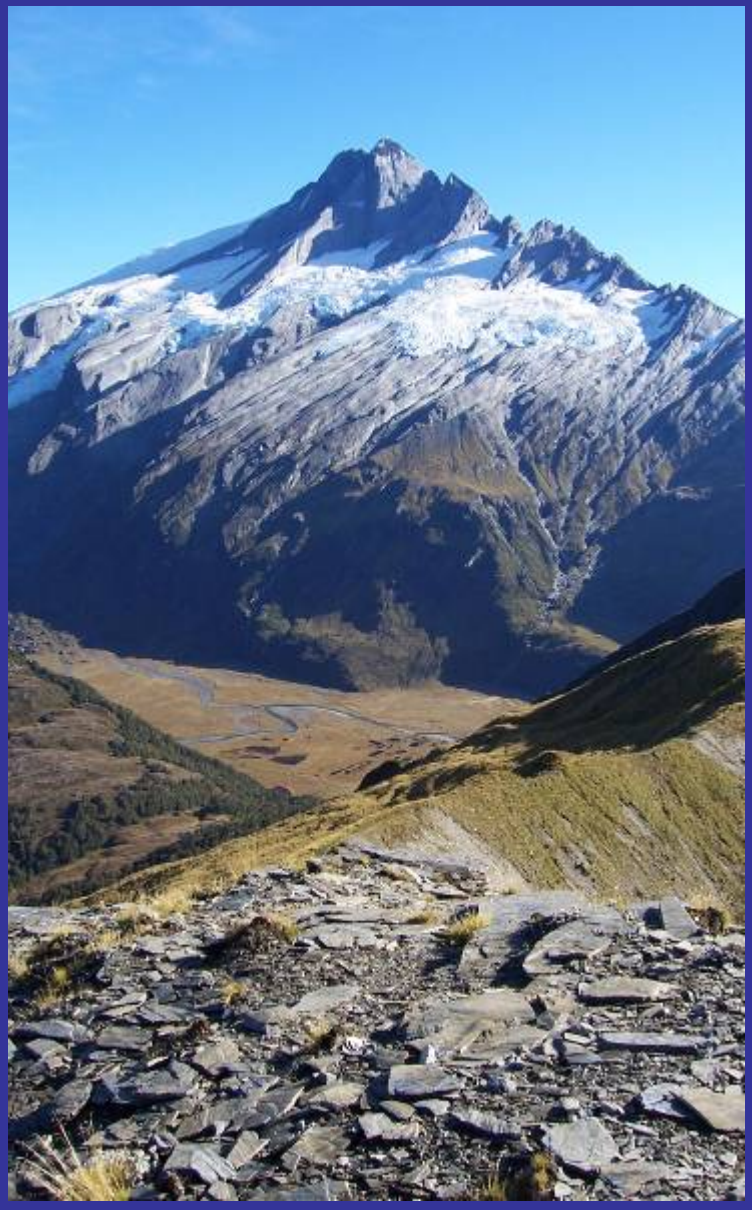
Fertmark/ Spreadmark

- Fertmark quality standard to audit fertiliser label specification
- Spreadmark to audit applicator efficiency
- Both administered by Federated Farmers

Soil management

- Increasing focus on micronutrients
- Monitored via soil, herbage and animal tissue testing
- Recognition of role of worms and microorganisms
- Water retention and filtering

Conservation



- Farmer philosophy of sustainable and multiple use of resources
- Government philosophy of preservation of indigenous resources
- 33% of NZ land under Dept of Conservation management
- Limited grazing

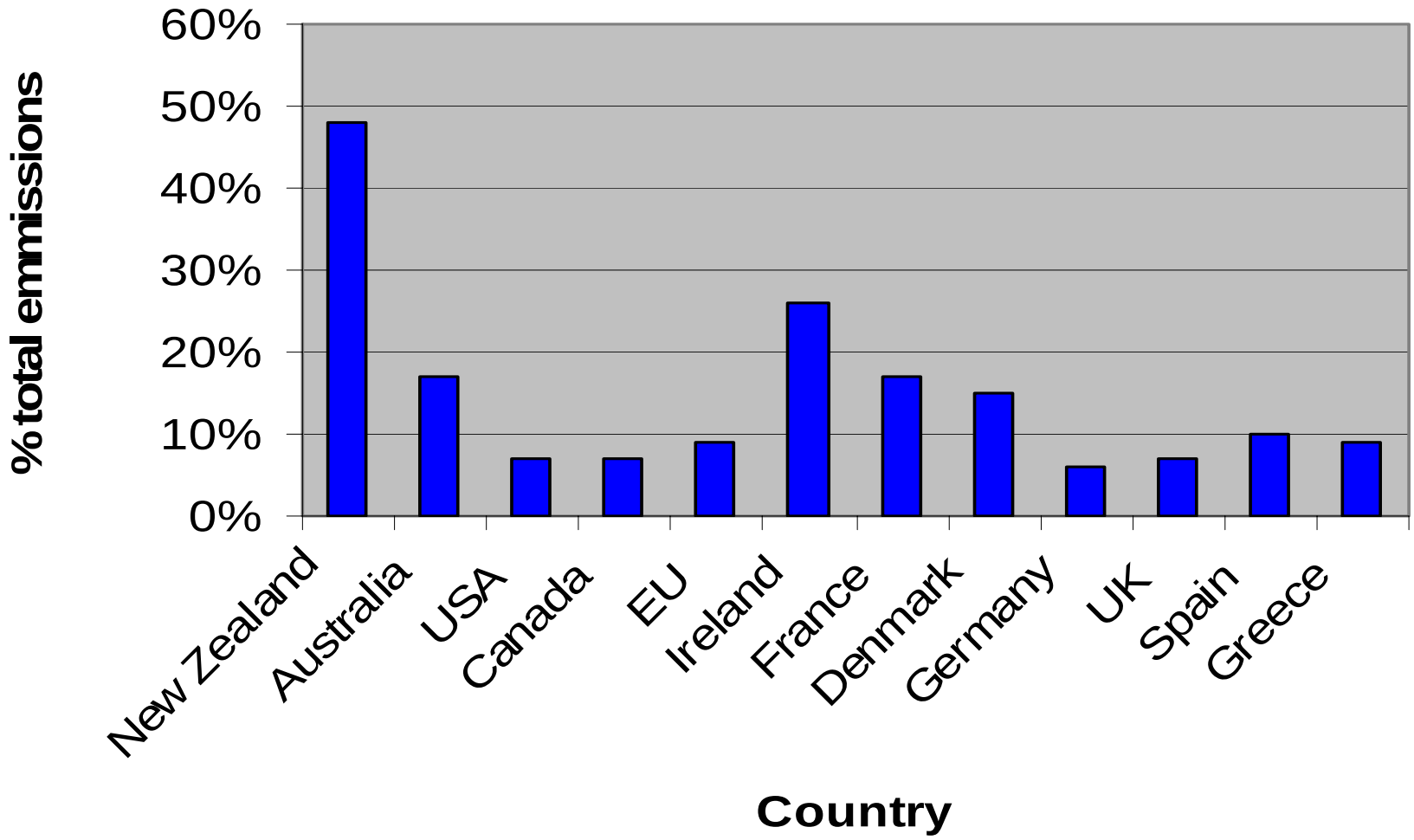
Alec Jack

- Intensive beef finisher from northern NZ

Kyoto Protocol

- Ratified in 2005
- 4m people
  - 39m sheep
  - 4.4m beef cattle
  - 5.3m dairy cattle
  - 1.4m deer
- Thus 48% of our emissions are CH_4 & N_2O from agriculture

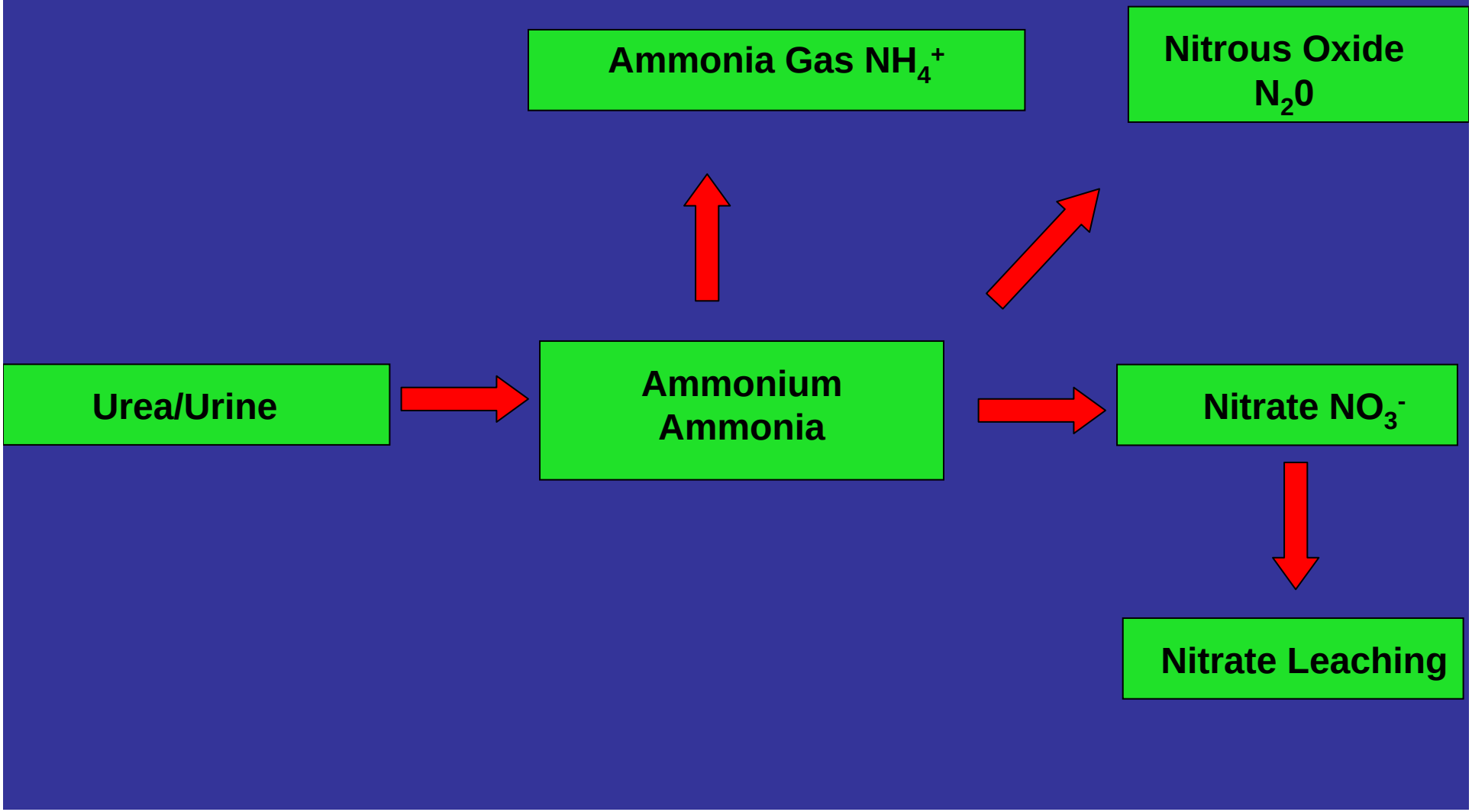
2005 UNFCCC Figures on CH_4 & N_2O emmissions from agriculture



Nitrogen

- NZ a small user of N fertiliser
- Rely on rhizobia on clover roots
- Animal urine our major concern
- N losses via NH_4, N_2O and NO_3
- Also cations K, Mg and Ca
- Developed N inhibitors

Nitrogen cycling



Research

- Pastoral Greenhouse Gas Research Consortium
- Sheep, beef, dairy, deer and agribusiness industries and Government
- Fund research into reducing CH_4 and N_2O

Methane

- PGGRC funding world leading research into rumen function
- Modify microbial activity
- Especially methanagens which convert H to CH_4
- Research into animal feeds, genetic variation, feed additives
- Difficult, no significant recommendations
- Need technology to measure at farm level

Carbon dioxide

- Will use same methods as rest of world
- Low users of fossil fuel per unit of food output

Farmers

- Currently NZ is the only country planning to use price measures against CH_4 and N_2O from agriculture
- Farmer position is that any price measures must be in tandem with other competing nations
- Our greenhouse output/unit food produced is low

Government support

- During 1950s to 1970s research gave huge increases in productivity
- During 1980s focus moved to environment
- Government support for agriculture withdrawn in 1985
- Major readjustment for farmers and service industries
- Much stronger and competitive industry

Sunset

- Government, media and academics saw agriculture as a sunset industry
- Loss of research
- Talented people went elsewhere
- Agriculture productivity grew by 4%/ annum cf rest of economy 1.9%
- Now belated recognition of importance of agriculture

Producer levies

- Recent increase in Government funding for research
- All major agricultural producer groups levy ourselves for research
- These levies mandated by producer votes every 5 years

Summary

- NZ environmental standards are very good
- Challenge is to maintain that
- Relatively low greenhouse gas output per unit of production
- High standards of animal welfare and food safety
- See ourselves as producers of high quality food and fibre for high value world markets