

# What is the dairy industry doing to sustain its soils ?

Warwick Dougherty

Richmond, NSW

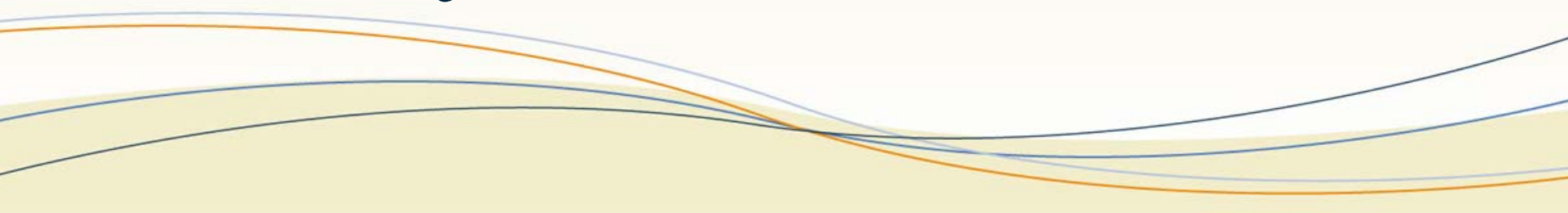
[warwick.dougherty@dpi.nsw.gov.au](mailto:warwick.dougherty@dpi.nsw.gov.au)



# The Australian dairy industry

- Located in coastal or irrigation districts
- Recent de-regulation of fresh milk market
- From 1980-2005....
  - Farm numbers decreased by 60%
  - Stocking rate increased by 90%
  - Production (L/ha) increased by 235%
  - Feed imports increased by 740%
  - Substantial increase in fertiliser use
  - Substantial increase in irrigation
- Tend to be accumulators of N & P

# Challenges to healthy soils in dairying

- Chemical, physical and biological, e.g.,
  - High inputs of nutrients
    - poor efficiency of use
    - nutrients being lost to environment
  - High stocking rates
    - compaction
    - erosion
  - Impact of farming system on biology
    - compaction
    - fertility
    - irrigation
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# Improving soil fertility management

- Potential off-site impacts and economic cost
- Various research projects (early 90's –current) examining BMPs for minimising environmental impact (water and greenhouse gases)
- Key outcomes
  - some BMPs
  - no quick fix
  - optimise whole system nutrient management

# Improving soil fertility management

- ‘Better Fertiliser Decisions’ (2002-2007)
  - national project
  - refine soil fertility targets
  - wide range of stakeholders engaged
- ‘Accounting for Nutrients on Australian Dairy Farms’ (2006-2010)
  - national project
  - identify pools and fluxes of nutrients
  - refine ‘whole system’ nutrient management
  - wide range of stakeholders engaged

# Soil physical health

- Increased stocking rates
  - compaction, structural decline
  - pugging a major issue
- Resilience provided by:
  - permanent pastures
  - high carbon levels, 3-6% (30-60 t/ha 0-10cm)
- BMP's in place
  - avoid grazing when wet
  - on-off grazing
  - wide-spread adoption of 'feed-pads' or 'loafing' areas

# Soil biological health

- High C and soil moisture favourable ?
- Dairy soils have high microbial biomass C, >1000 mg/kg (Gourley, 2001, Burkitt et al 2007)
- Large earthworm populations, >300/m<sup>2</sup> (Gourley, 2001, Burkitt et al 2007, Chan and Barchia 2007)
- No effect of stocking rate nor P fertiliser rate on micro-, meso- and macro-fauna (Gourley 2001)
- Comparison of conventional and biodynamic systems – no differences (Burkitt et al 2007)
- Weakest component of soil health understanding ?

# Achieving management change

- Sustaining our Natural Resources – ‘Dairying for Tomorrow’

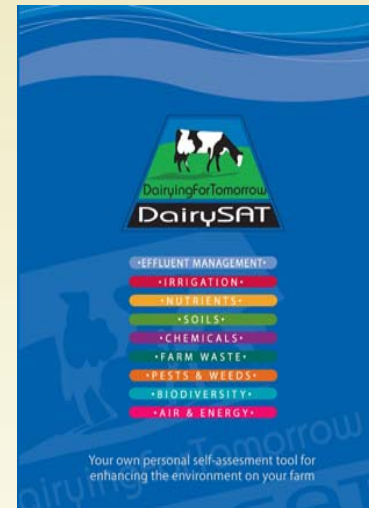
*‘dairying systems contribute to healthy and sustainable catchments and communities’*



- R&D and on-farm adoption projects
- 8 Regional Dairy Programs each with NRM ‘Regional Action Plan’ and DfT coordinator
  - facilitate dialogue between stakeholders
  - facilitate and monitor improvements in NRM management

# Achieving management change

- Wide range of BMP's
  - sustain soils, production and environment
  - incorporated into wide range of programs
- Dairy Self Assessment Tool
  - farmer evaluation of management
- Farmer Targets for Change
  - defines management based on catchment objectives
  - facilitated by DfT coordinators with internal and external funding



# Sustaining soil health in the future

- Changes in industry brought about by:
    - changing markets, terms of trade, technology and policy
    - climate change
  - Dairy Australia's 'Soils Business Plan, 2007-2012'
    - improve understanding of soil physical and biological health
    - develop appropriate indicators
    - quantify costs and benefits
  - Soil health will be sustained and improved via a combination of research, extension and facilitation of on-farm management change
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