Reducing N leaching and P loss on Southland dairy farms

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Matthew Newman - 4 February 2016

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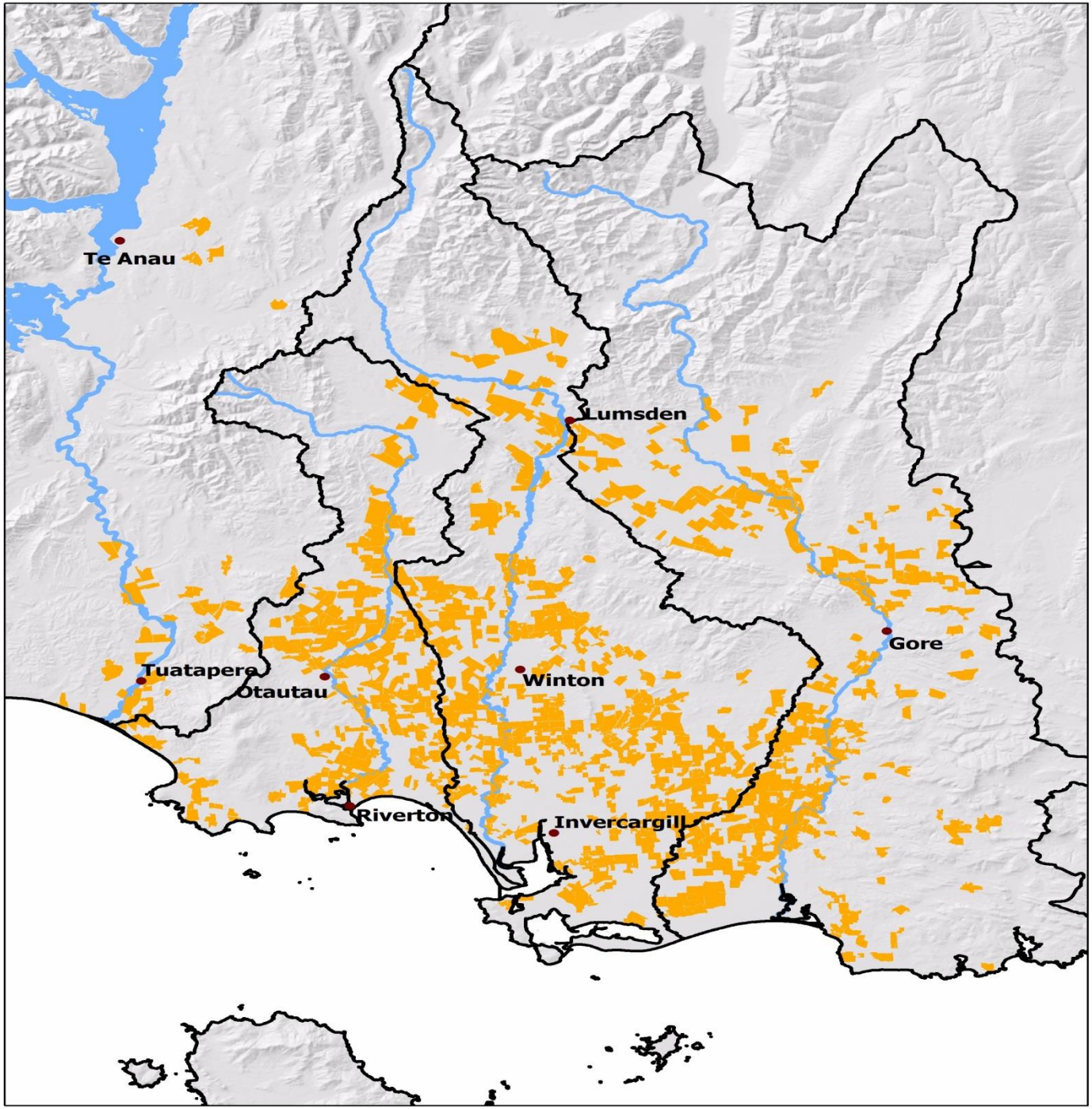
Southland Economics Project Overview

- Part of the ES Water & Land 2020 & Beyond
- Objective – determine economic impacts of potential catchment limits to manage water quality

    1. Economic Sectors
    2. Regional Outcomes
    3. Community Outcomes


Te Anau
Lumsden
Gore
Tuatapere
Otautau
Winton
Riverton
Invercargill

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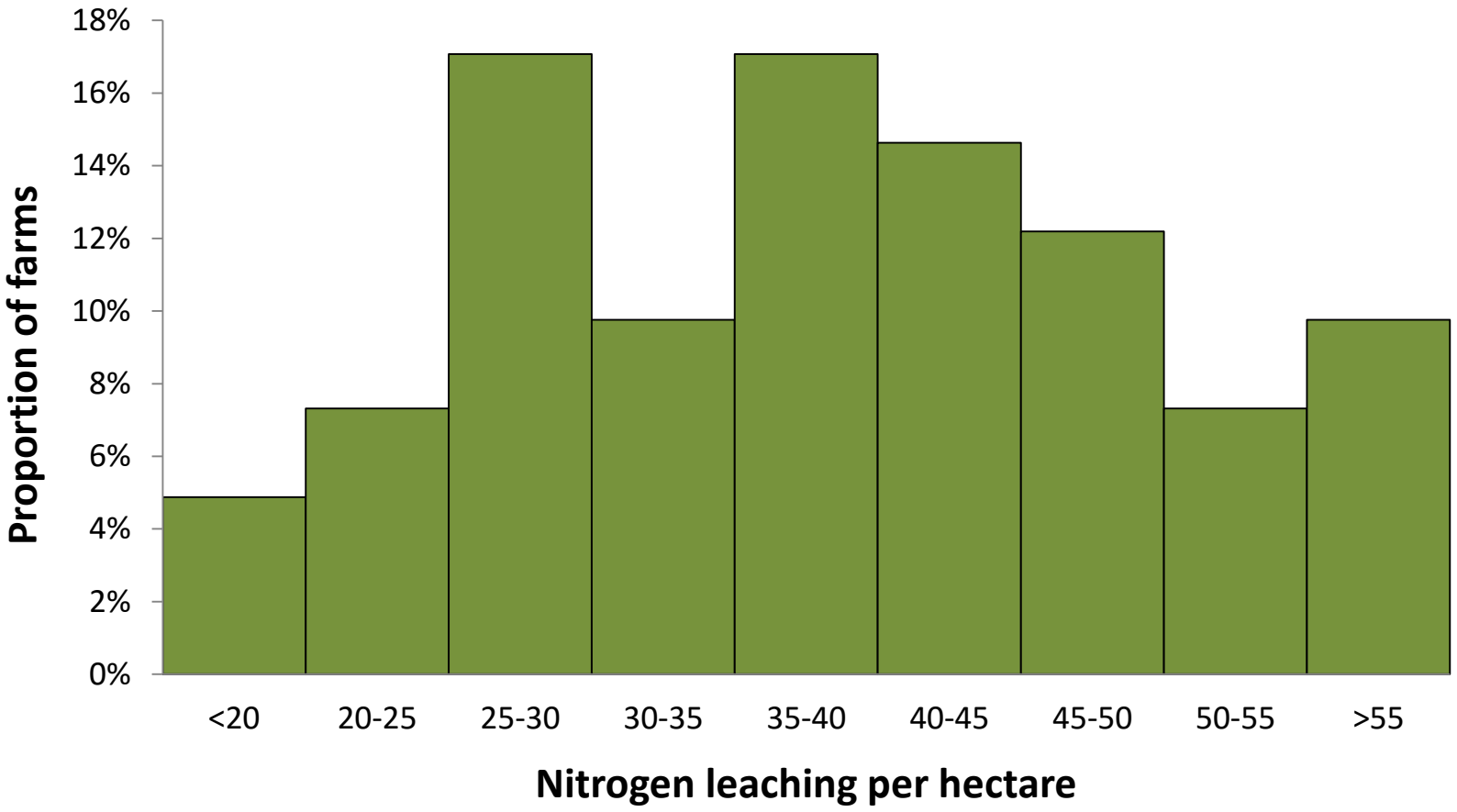
Process

- 4 FMUs
- 41 case study farms
- Farm selection - not random
- Aim to cover key farm system and biophysical characteristic– soils, rainfall, stocking rate, system type, infrastructure, financial performance
- Collection of physical and financial data
- Creation of Overseer and Farmax base files
- Mitigation modelling- abatement cost curves

Distribution of Base N Leaching



44% of farms 25-40 Kg N leaching /ha

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Modelling Approach

- Case studies only – not catchment averages
- Simultaneous FARMAX and Overseer modelling
- Output based and standardised prices
- Pre policy - Targeted 10%, 20%, 30% and 40% reductions in N and P losses (stop when land retired)
- Mitigation options investigated (in terms of impact on nutrient loss, production and profit)

FARMAX YOUR ADVANTAGE

OVERSEER®

DairyBase

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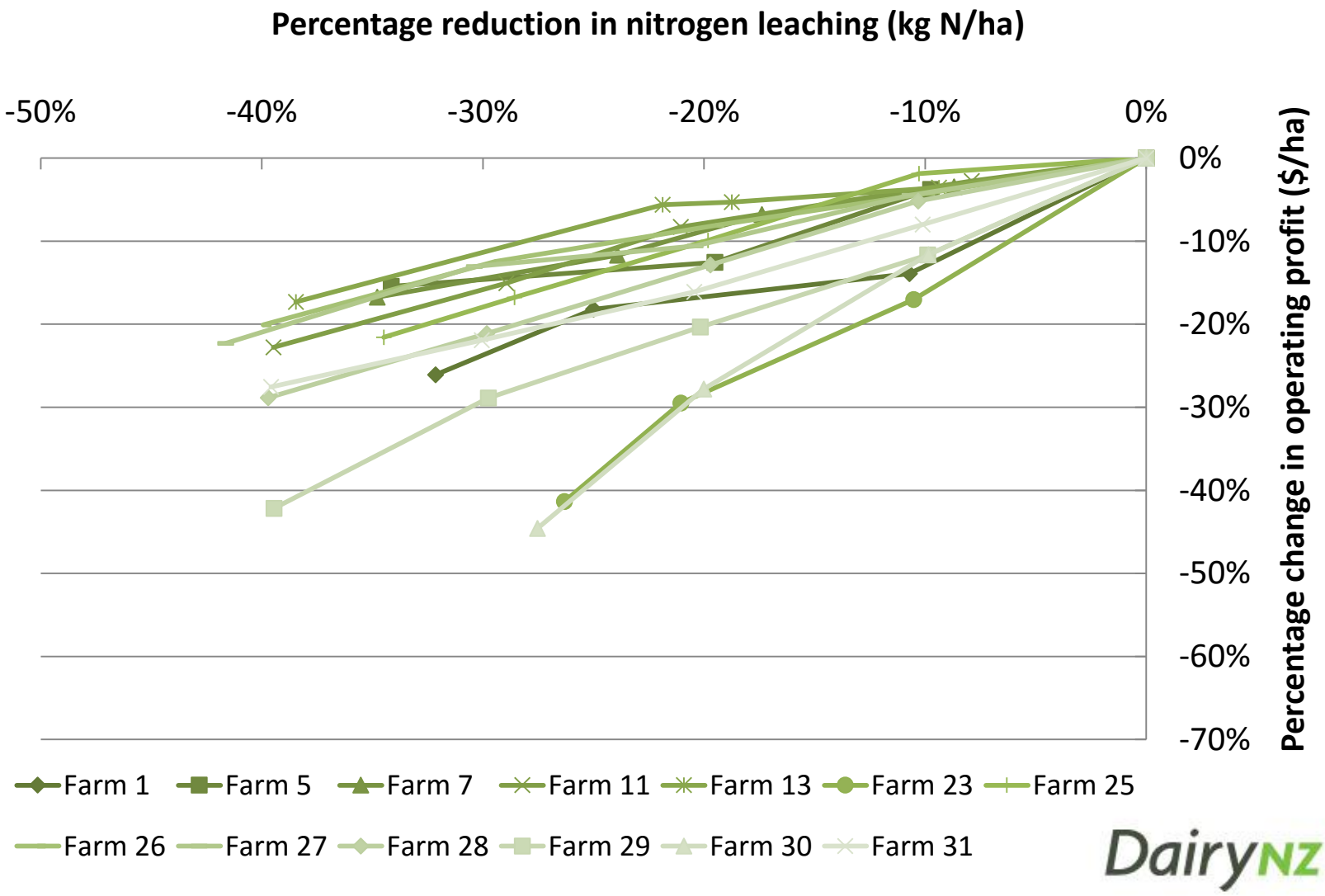
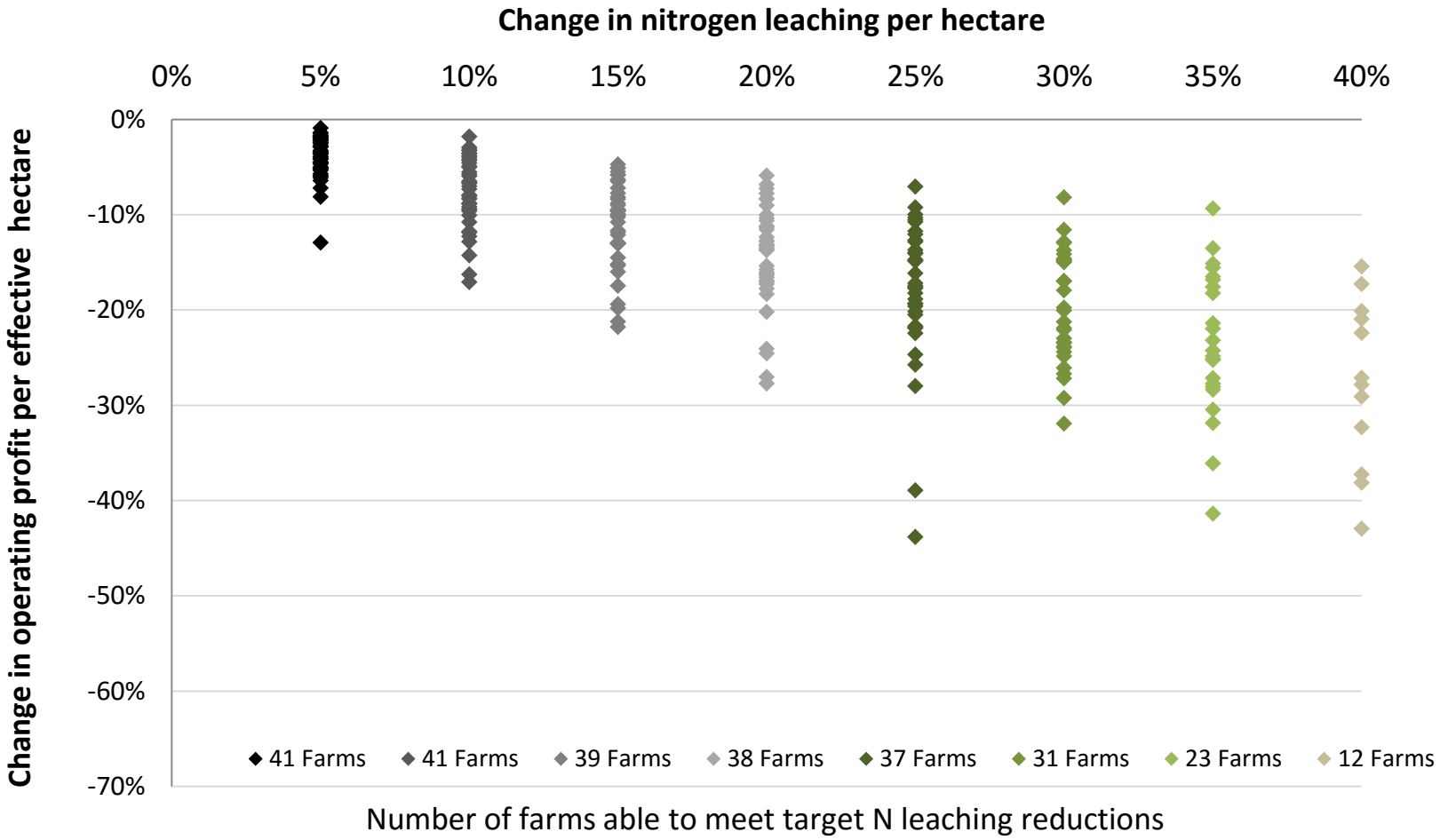
Mitigations- Nitrogen

- Standard mitigation measures;
  - Off paddock structure usage (if farm has one)
  - N fertiliser use (timing, application rates volumes, cows and supplements used to balance reduced pasture growth)
  - Cow numbers (within 20%)
  - Supplements imported (same system type)
  - Other: effluent management, cropping, ProGibb, barns.

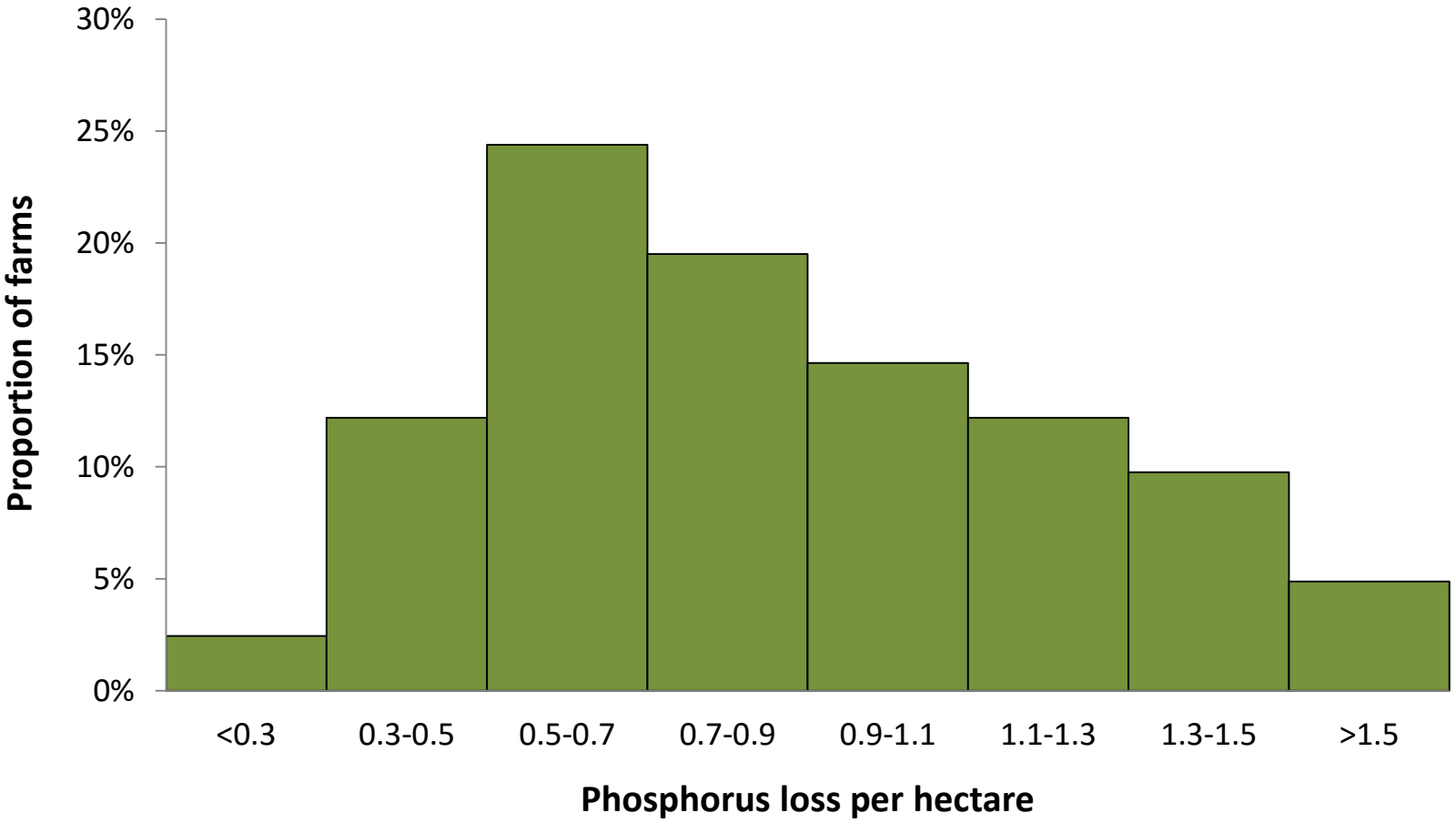
Abatement Curves - Oreti



Distribution of nitrogen abatement cost



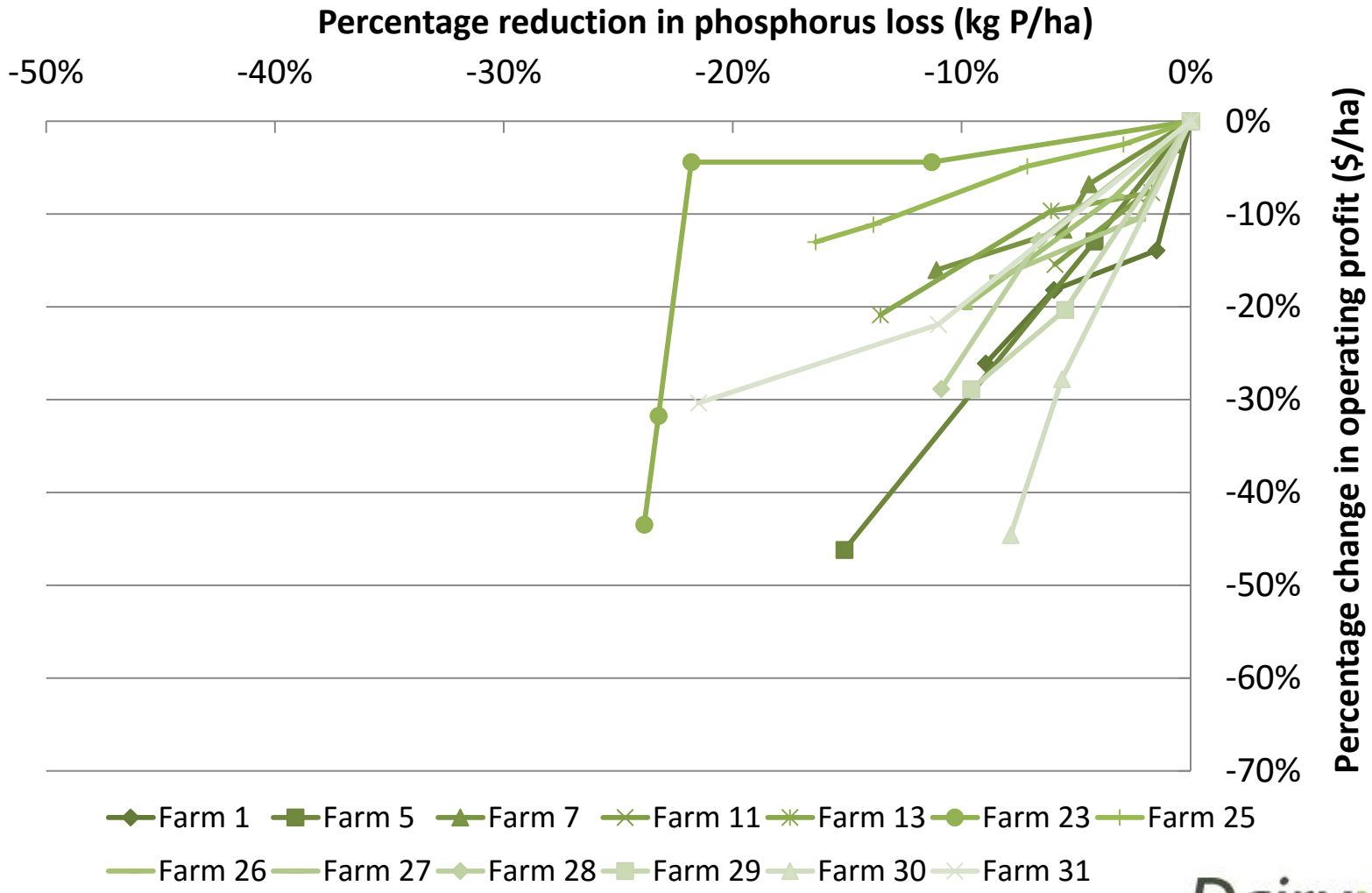
Distribution of Base P Loss



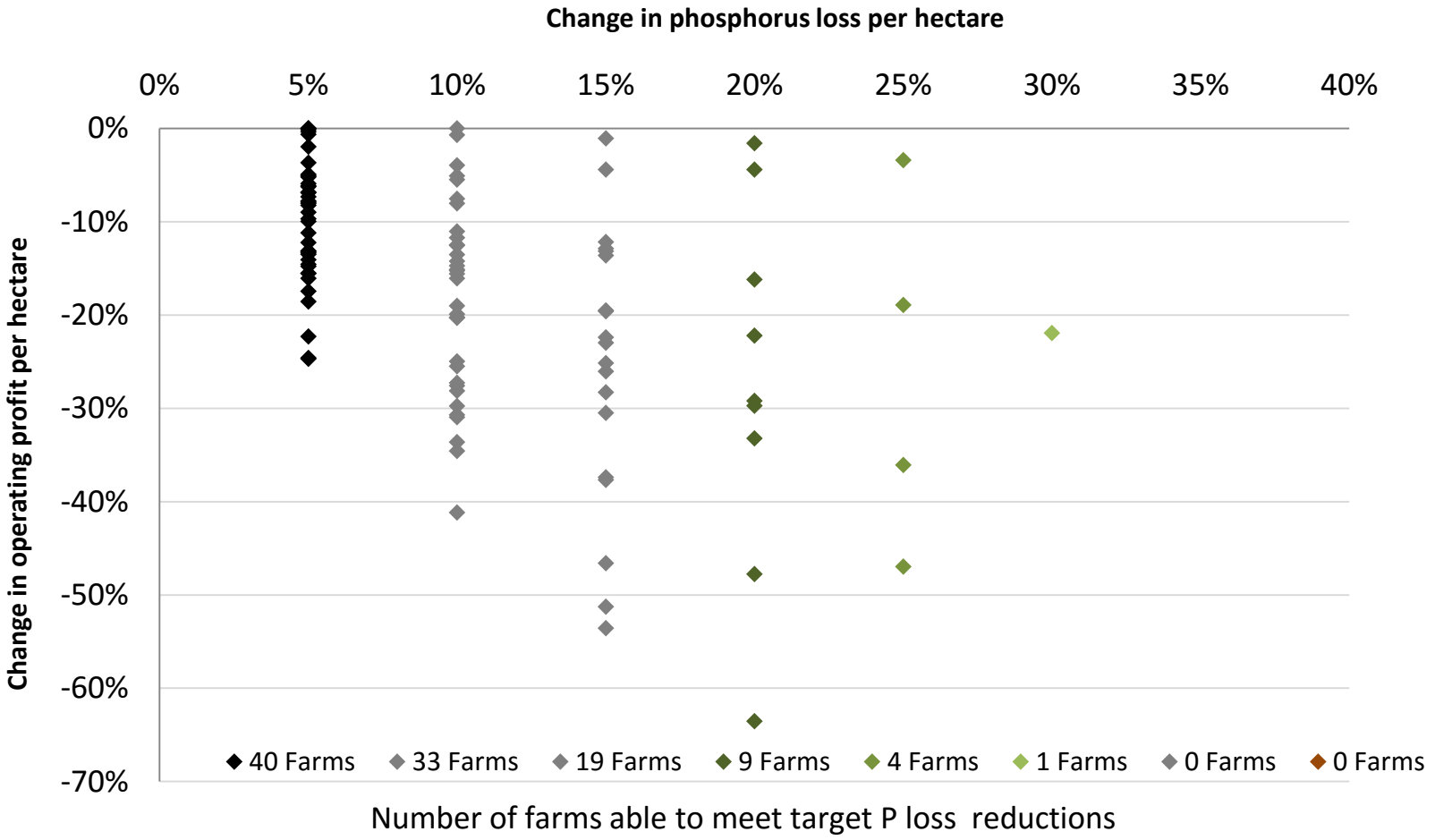
Mitigations- Phosphorous

- Standard mitigation measures;
  - Change to RPR fertiliser
  - Reduce Olsen P (no less than 30)
  - Target P fertiliser timing and application size
  - ‘Big’ changes; reduce cow numbers, once a day on some farms for part of season, target cropping size, effluent management.

Percentage reduction in phosphorus loss- Oreti



Distribution of phosphorus abatement cost



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Summary

- Good spread of farms – location, system, financial
- Case study only, can not be used to get average FMU N or P loads
- Static annual average losses – no transition
- Not all farms can reach 40% N without land retirement
- P mitigation difficult and expensive on dairy farms
- Affordability highly sensitive to milk prices
- Interest and capital need to be considered