

How Nelson-Tasman landowners can help solve the climate crisis



Plan for the evening

- Welcome and giving thanks
- Guy Salmon, Ecologic Foundation. The challenges and opportunities for landowners.
- Rod Oram, business journalist. Can we work with nature to restore ecosystems and mitigate the climate crisis?
- Annette Litherland. Farm systems approaches to reducing methane on farms.
- Points of clarification
- Discussion.
- Break out session How do you think landowners can solve the climate crisis? What are the barriers for landowners? What are the opportunities? Could we work together in a catchment?

Farm systems approaches to reducing methane on farms

Dr Annette Litherland
Farm Systems Scientist
NZ Landcare Trust



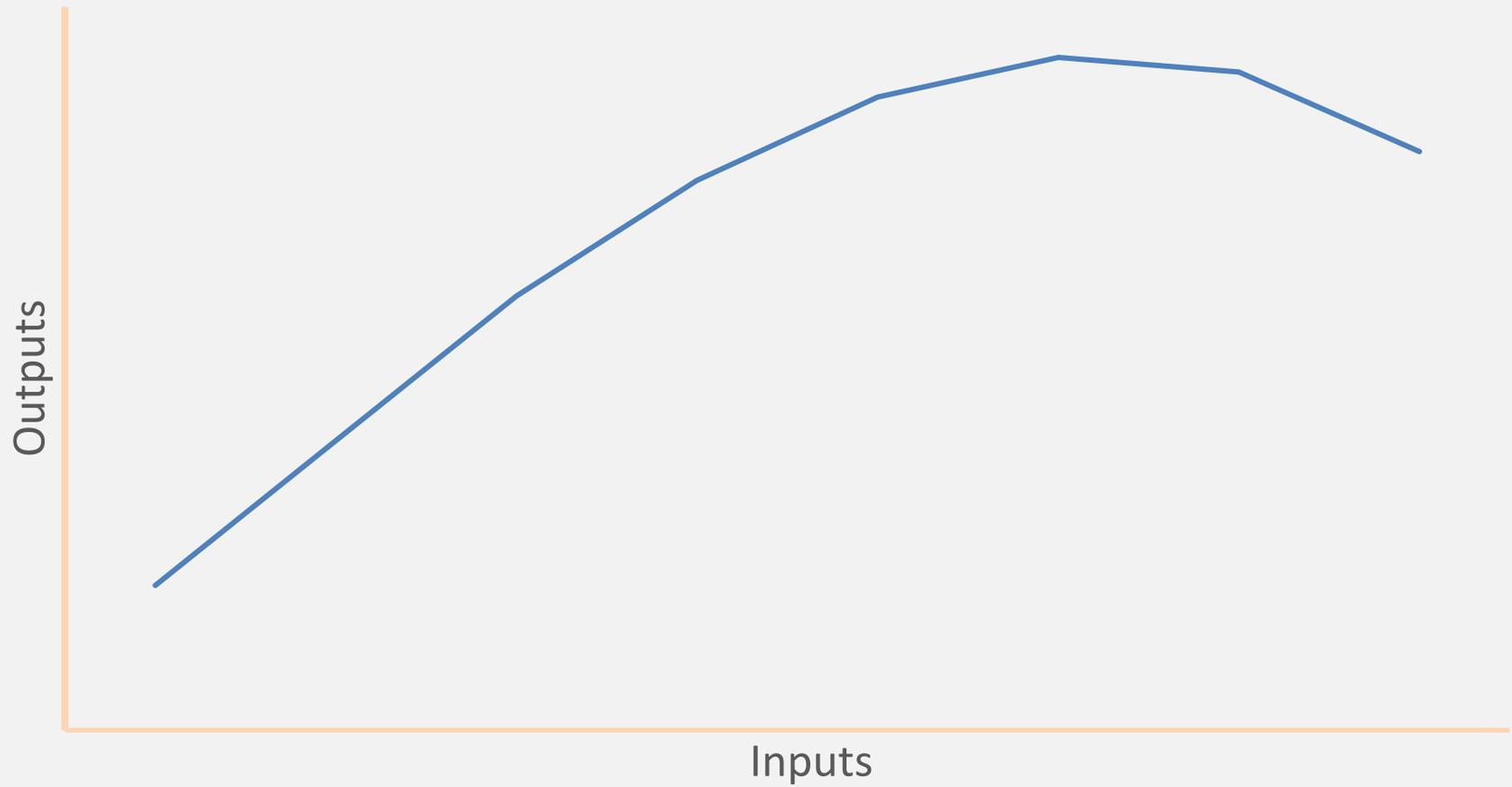
Research options coming available

- Global research alliance (65 countries)
- He Waka Eke Noa: Primary Sector Climate Action Partnership
- Methane inhibitors (3NOP, -30%, seaweed? -60%)
- Animal breeding (-1%/year)
- Nitrous oxide inhibitors (-30%, N₂O)
- Plantain (-25% N₂O and CH₄)
- Capturing methane as produced (-53%)
- Vaccine
- Soil carbon?
- Mitigation through trees

Farm systems approach

- Removal of subsidies sheep and beef industry 1980's
- Farm system is a combination of many inputs and some outputs
- NZ farming has been largely focused on increasing production through improved inputs, feeding, genetics and labour saving technologies to improve efficiency
- Our systems and stock have become more efficient
- Now we are being asked to reduce overall environmental impacts (water and GHGs)
- To maintain profits, I suggest to achieve the 10% reduction by 2030 can be achieved by examining marginal returns within the current farm system

Marginal returns



Farm inputs are very complex and are all inter-related

- Stock numbers (total, reproductive and death rates)
- Stock timing (mating/sale/cull/purchase dates)
- Stock type (breeding, finishing, species, genetics)
- Fertiliser (nutrients N, P, K S, lime, rates, timings)
- Bought in feed (types, timing)
- Grown pasture (amount, season, quality, utilisation, rotation length)
- Crops (summer, winter, types, yields, single vs multiple,)
- Irrigation (Capital costs, running costs, reliability, DM response, efficiency)
- Labour (staff, contract)
- Climate (rain, temperature, variability)
- Product returns (amount, year and seasonal variability)

Enviro-Economic Model (E2M)

- Energy based system.
- Uses marginal analysis (marginal cost, marginal return).
- Set up existing farm system.
- Set a target goal e.g., reduction of GHG.
- Inputs can be fixed, and others allowed to vary.
- The model uses a continual “feedback loop” that allows many resource combinations to be examined.
- Selects optimum profit solution for your target goal.
- No other model in NZ can do this.
- Responses will vary from farm to farm.
- Works for all types of livestock farms (sheep, beef, deer, dairy).
- Modelled 2 Top of South dairy farms

Best outcomes from limited modelling

Farm 1 (Malborough)

- -16% cows, +8% kgMS/cow, -30% N, 0 PKE or maize silage, more alternative forages
- +29% profit, -13% N leaching, -18% GHG



Best outcomes from limited modelling

Farm 2 (Tasman)

- -17% cows, + 9% kgMS/cow, -71% bought in feed, -40% N, more drought tolerant species, 10x more home grown supplements, reduced grazing off.
- +17% profit, -32% N leaching, -26% GHG

Both these farms had runoffs with tree block that could grow enough trees to offset their GHG ie 40-50 ha of exotic hardwoods



Other information on E2M modelling

- 27.02- 31.4

<https://www.youtube.com/watch?v=bl3tuI7im3I>

For full interview of Barrie and Matt on Sarah's Country go to get the link off NZ Landcare Trust topofsouth facebook page.

Describing how the model works [E2M technical foreword](#)

- **E2M - Intro. and Demo. - Detailed Overview** (38min) <https://youtu.be/SmEx7irZP14>
- **E2M - Intro. and Demo. - Quick Overview** (19 min) <https://youtu.be/kSHcWXJ08Sc>

For copy of this modelling done in Top of the South [TOS E2M modelling](#)

Conclusions

- Most (not all) farmers will be able to make farm systems to reduce GHG and make more profit or maintain profit.
- Low carbon foot products, keep ahead of our competitors
- Farmers are all now calculating their GHG emissions
- They will then work on their own solutions
- Highly likely farmers will move much more rapidly than urban NZ
- They will be NZ's carbon heroes
- Any points of clarification?