FARM ECONOMIC METRICS

1. Acquire Primary financial data for individual farm businesses

Industry standard metrics (sheep & beef example)

Indicator	Calculation /method
Economic Farm Surplus (EFS)	Gross farming revenue, Less (farm operating expenses + wages of management + depreciation)
Animal Health expenditure per stock unit	$ spent on Animal Health and breeding divided by opening stock units
Fertiliser expenditure per stock unit	$ spent on macronutrients, trace elements, nitrogen, lime, and any other additives
Seed expenditure per stock unit	$ spent on multispecies pasture or winter crops mixes
Feed expenditure per stock unit	$ spent on mineral and supplementary feed (winter)
Feed Conversion Efficiency (FCE)	Kg of DM fed to produce 1 kg of carcass weight (product). Requires a full Farmax model to be maintained for the business to derive this accurately
Return on Capital	EFS divided into the total capital of the business (Land, stock and plant).
Price per kg product	Total kg lamb, mutton, beef & wool divided into total receipts

Examples of non-standard metrics better suited to the RA context

- EFS per hours worked (owner / manager, employees)(to address concerns with time investment for AMP grazing)
- Long-term return on investment in natural capital (e.g. investment in soil health by planting diverse cover crops and multispecies mixes, expected to yield positive financial gains in subsequent years by reducing fertiliser costs, etc..)
- Investment in natural capital leading to savings on compliance costs
- Carbon credits (Trees)
- EFS per Kg CO_2 emitted or unit nitrate leached

Other metrics could be included to determine the impact of "stacking" enterprises on EFS (i.e. multiple produce generated from same land unit area)

2. Modelling / Forecasting (using primary financial data)

- Financial farm models constructed for time series analysis, to examine output and structure of the business.
- Scenario analysis to assess the impact of given farming system over 5, 10, 20 & 30 years (co-developed with farmers to choose relevant scenario e.g. drought)
- Scenarios analysis relating to NZ trading environment (e.g. using the Lincoln Trade and Environment model) – can be used to test the influence of global markets

3. True Cost Accounting and natural capital valuation

- Relevant for understanding the relationship with the finance sector (securing bank loans, impact or philanthropic investment, etc..)
- Multiple scale can be considered using scenario analyses: individual business, landscape (e.g. catchment), industry
- Relevant when financial gains can be made from ecosystem services – and for access to markets via traceability and transparency

Recommended research approaches to evaluate the impact of RA on financial returns (1-3 above)

- Pairwise comparisons of RA & neighbouring commercial farms –requires neighbouring farms to be comparable in their biophysical and business attributes.
- Assessment of RA commercial farms against regional averages.
- Comparing model outputs for multiple farms (>50) adopting RA versus not adopting RA

- Scenario analyses to assess potential future changes in international markets and how they may affect New Zealand's financial returns from agriculture –requires large datasets and computational capability
- Comparing outputs from true cost accounting / natural capital valuation at regional scale or industry scale assuming various level of RA uptake