Three amigos and a big IDEA: the development of an optimisation model of a New Zealand dairy farming system

Friday, 28 October 2011
1.10pm – 2.00pm
MSB.0.01

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Abstract:
New Zealand dairy farms are complex agricultural systems that produce this nation’s key export commodity. There is considerable debate surrounding the relative value of alternative management options within these systems given their complexity. A constrained nonlinear optimisation framework, the Integrated Dairy Enterprise Analysis (IDEA) model, of a New Zealand dairy farm has been developed that allows such complex problems to be investigated. The IDEA model is notable for its rich description of pasture and cow biology that removes biases present in other optimisation models of grazing systems. The ability to optimise elements of the system is a key benefit, as profitable responses to external shocks often requires changes to multiple system components given their integration. Representative output and the extension of the IDEA model to incorporate greenhouse gas mitigation within New Zealand dairy farms will be discussed. Overall, the model provides an important example of the benefits of incorporating greater complexity in optimisation models of agricultural systems.

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