

Avoiding the Pitfalls of Uncertainty

By David Adamson

RSMG

School of Economics

University of Queensland

3 Take Home Messages

- Challenge the way economics is applied & making sure we get the basics right
- Investigate a state contingent approach to mitigate uncertainty
- Use modelling as a communication tool to highlight the areas of concern

Economic Evaluations

- Policy Environment
- Who does them
- Approaches Used
- Improve what can be done

IRA Policy Limitations

“3.6 In keeping with the scope of the Quarantine Act 1908 ... and Australia’s obligations as a member of the WTO, economics considerations are taken into account only in relation to matters arising from the potential direct and indirect impact of pests and diseases that could enter, establish or spread in Australia as a result of importation.

The potential competitive economic impact of prospective imports on domestic industries is not within the scope of IRAs” (Biosecurity Australia 2003).

Who does them

- In house (State & Federal departments or research organisation)
- Industry groups
- Consultants for both
- Educational Institutions (thesis etc)

- Normally done to justify funding or prevention of market loss.

Economic Approaches

- Evaluation of cost (non market)
- Evaluation of cost (market)
 - back of envelope (Yield loss, increased costs)
 - full or partial equilibrium analysis
- Middle ground & greater reliance on techniques developed in pest management economics. E.g. Determine the investment criteria

Adding Capital

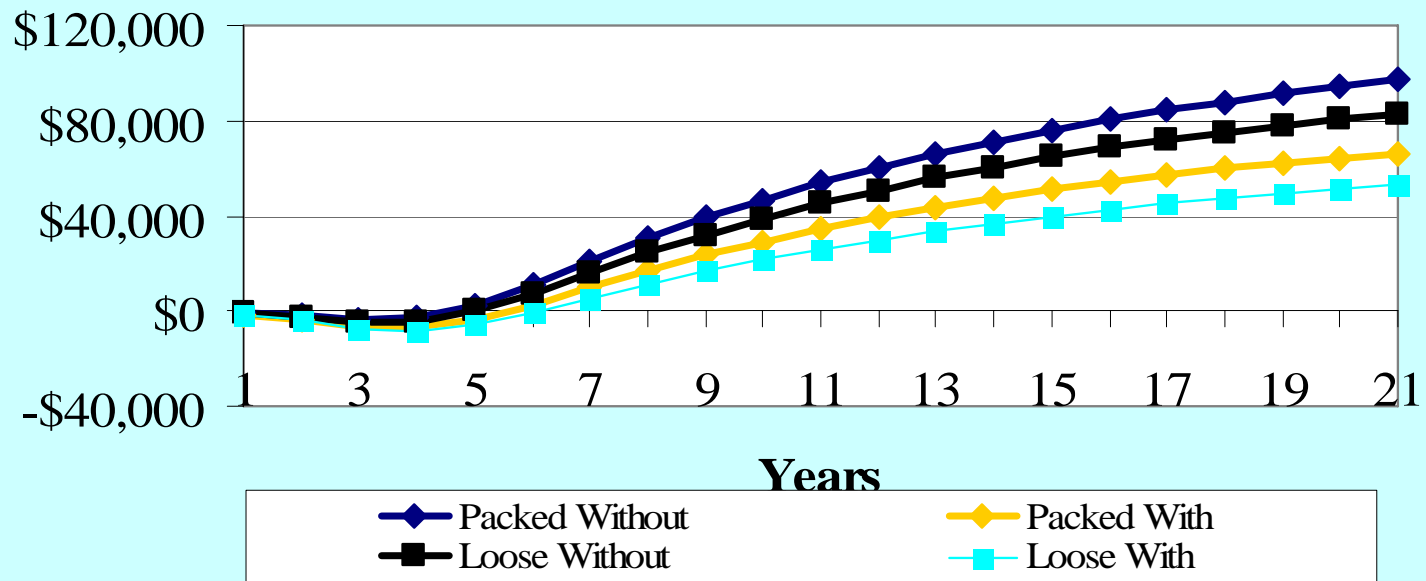
- Capital generally ignored in the story & important for perennial crops.
- Impact of fire blight on apple production systems & what happen to a rational investment decision
 - Packed apples
 - Loose apples

Economic v Financial (\$/Ha)

	'Packed Apples'		'Loose Apples'	
	'Without'	'With'	'Without'	'With'
Income	\$63,850	\$51,080	\$34,035	\$27,228
TVC	\$43,787	\$37,853	\$21,101	\$20,060
Gross Margin	\$20,063	\$13,227	\$12,934	\$7,168
Opp. Labour	\$1,778	\$1,778	\$1,778	\$1,778
Capital Repayments	\$4,738	\$4,738	\$4,325	\$4,325
Economic Return	\$13,548	\$6,712	\$6,831	\$1,066

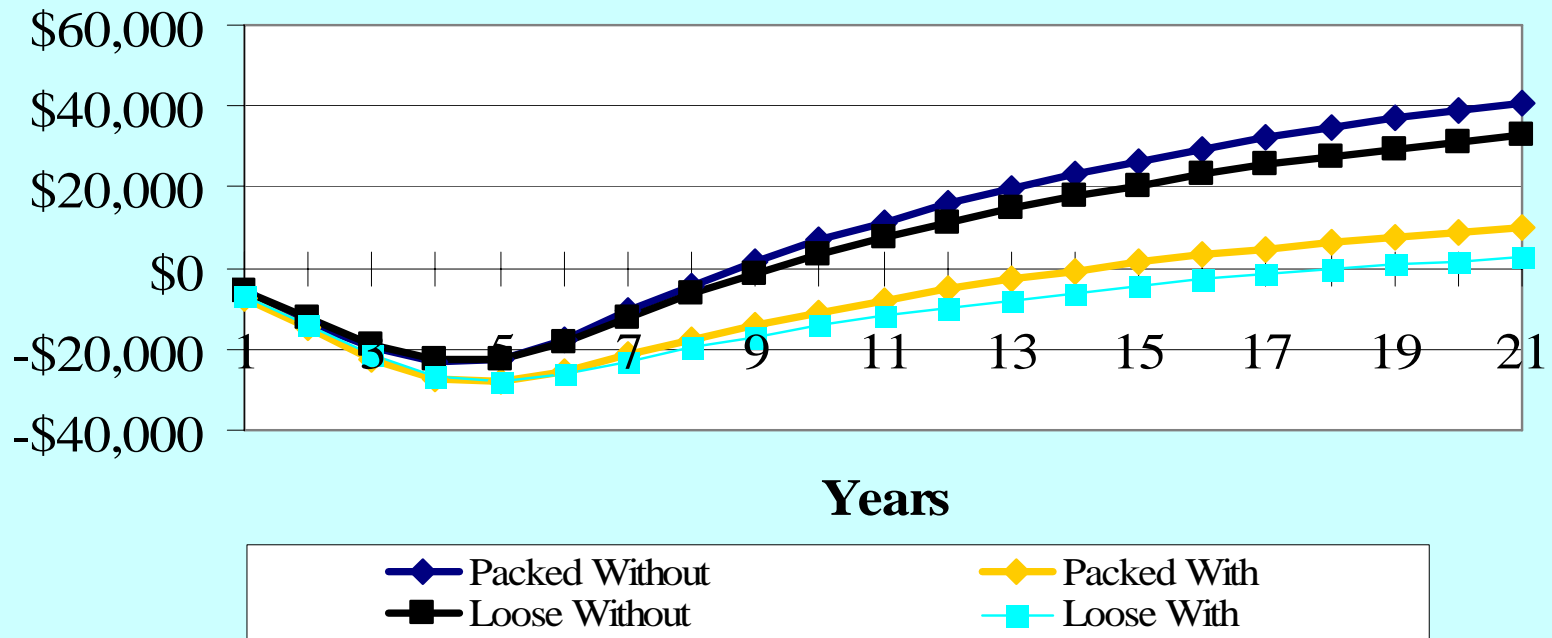
No Capital

Discounted Carry Over (Excluding Capital)



Capital

Discounted Carry Over (Including Capital)



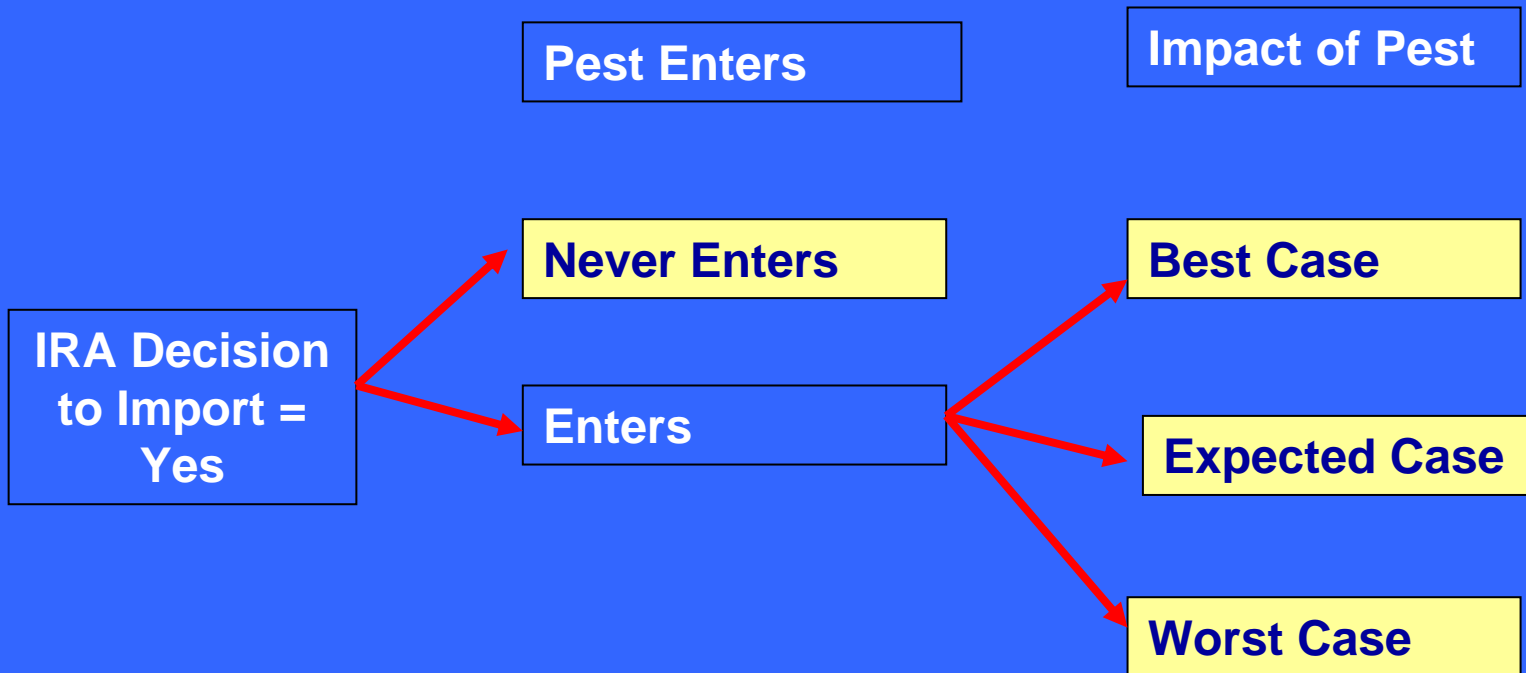
Economics

- Get the basics right
- Challenge restrictions
 - Compensation
- How do we deal with future possible impacts of biosecurity

State Contingent Approach

- Helps determine production under uncertainty.
- For every state of nature there is a known probability.
- When people make choices they have already taken consequences into account.

Decision Tree



IRA Pay off Matrix

Biosecurity	Pest Impact (State of Nature) (\$'m)		
	Low	Medium	High
Never Enters	\$100		
Enters, Best Case	\$100	\$50	\$30
Enters, Expected Case	\$20	-\$50	-\$80
Enters, Worst Case	\$0	-\$100	-\$200

Probability of State

Biosecurity	Pest Impact (State of Nature) (\$'m)		
	Low	Medium	High
Never Enters	40%		
Enters, Best Case	2%	5%	1%
Enters, Expected Case	5%	15%	5%
Enters, Worst Case	5%	13%	9%
Pay off of Decision		\$3.3	

State Contingency

- Precautionary approach to the probabilities
- Decision makers forced to stipulate stance
- What we need is a framework for people to make informed decisions & a communication tool

Communication

- NPV stands for Net Present Value or nuclear polyhydrosis virus.
- Modelling can provide a framework for communication

Models & Biosecurity



Forecasting Models

- Subjectivity, data limitations, assumptions
- Ability to chop change assumptions, data sets, case studies to take into account the differences in opinions
- Give people the model to take home and play with so they satisfy their concerns

3 Take Home Messages

- Get the production systems right
- Try a state contingent approach to mitigate uncertainty and incorporate the extremities
- Use modelling as a communication tool to highlight the areas of concern but understand their limits

Paper



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RSMG

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