

Pitcher's Name	Ed Lefley	Purpose	Dissertation Evolution 1
(A) Working Title	Primary producer decision making regarding the application of controls for feral pigs (sus scrofa)		
(B) Basic Research Question	<p>How, why and what decisions are made regarding controls at a farm level related to the control of feral pigs?</p> <ul style="list-style-type: none"> • Hypothesis 1: Farmers choose to undertake controls based on previous experience of both control technique and need for control • Hypothesis 2: Farmers minimise costs to maximise profits; therefore they undertake the minimal control they feel they need. 		
(C) Key paper(s)	<ul style="list-style-type: none"> • Bengsen, A. J., Gentle, M. N., Mitchell, J. L., Pearson, H. E., & Saunders, G. R. (2014). Impacts and management of wild pigs <i>Sus scrofa</i> in Australia. <i>Mammal Review</i>, 44(2), 135-147. doi: 10.1111/mam.12011 (Journal impact 3.919, most recent paper relating to current practice in management of feral pigs) • Fenichel, E. P., Richards, T. J., & Shanafelt, D. W. (2014). The control of invasive species on private property with neighbour-to-neighbour spillovers. <i>Environmental and resource economics</i>, 59(2), 231-255. (Journal Impact 1.703, Examines property rights and externalities, suggests the use of Pigouvian taxes to induce cooperation/application of controls) • Wilson, R. S., Tucker, M. A., Hooker, N. H., LeJeune, J. T., & Doohan, D. (2008). Perceptions and beliefs about weed management: perspectives of Ohio grain and produce farmers. <i>Weed Technology</i>, 22(2), 339-350. (Journal Impact 1.141, Examines farmers decision making strategies for control methods and options) 		
(D) Motivation / Puzzle	<p>In 2013 I returned to Australia and stayed with friends on the Liverpool Plains; when road kill was encountered there were at times 2 natives:1 feral pig; whilst out riding on the property it was not unusual to encounter pigs breaking cover and running from cover to cover. Control was often undertaken at harvest - after the damage was done - by having a pest controller in the header shooting the pigs as they lost cover. This drove an intellectual curiosity that has continued and grown as new challenges and problems have been encountered, and ultimately to examining farmers decision making process to understand why uptake of certain control methods are low, and why certain methods dominate.</p> <p>Crucially the damage that feral pigs could cause as carriers during an outbreak of Foot and Mouth Disease, having lived in the UK at the time of the 2000/2001 outbreak, and seen the non-agricultural sector struggle there is also this element to consider (Buetre, B., Wicks, S., Kruger, H., Millist, N., Yainshet, A., Garner, G., Hatt, M. (2013). Potential socio-economic impacts of an outbreak of foot and mouth disease in Australia: ABARES research report, Canberra, September.)</p> <p>Farmers often undertake controls to lessen the impact of feral pigs; however, not only do their actions, but also those of neighbouring properties impact on the effectiveness and cost of the control.</p> <p>As part of the decision making process, do farmers consider the action of others, what influences their choice of control and how do they decide when to apply controls? Why do some farmers cooperate, whilst others do not? Is there a worry about potential</p>		

	free riding by neighbours who choose not to undertake control? How do we induce cooperation if there is no cooperation at present? Are farmers willing to use new (to them) approaches?
THREE	Three core aspects of any empirical research project i.e. the "IDioTs" guide
(E) Idea	<ul style="list-style-type: none"> • Farm based decision making: maintain the status quo, apply controls (or use new control methods) and potential to cooperate with neighbouring farm(s) • Do farms cooperate, and if so do they get a better outcome for a given cost? - Prisoners Dilemma/Cooperative game theory • How can public sector bodies influence the management of pest species on farms and adjacent property? • Do farmers view pest control as an input, and therefore subject it to a minimisation to allow maximisation of profit?
(F) Data	<p>Q1: What data do you propose to use? Farm Level/Local Council area</p> <p>Q2: What sample size do you expect? 30 farms + (see Wilson, R., Hooker, N., Tucker, M., LeJeune, J., & Doohan, D. (2009). Targeting the farmer decision making process: a pathway to increased adoption of integrated weed management. Crop protection, 28(9), 756-764</p> <p>Q3: Is it a panel Dataset? Potential snowball data sampling method; may skew towards a cooperative bias/self selection. Intending to include a variety of producers and ownerships structures.</p> <p>Q4: What is the Data Source? Survey and questionnaire, conducted by researcher Possibly additional data from other (Government) bodies</p> <p>Q5: Will there be any problems with missing data? Potentially; will have a non-response code for analysis</p> <p>Q6: Will Test variables exhibit adequate variation to give good power? Depends on farm cooperation nature and willingness to reply of the respondents</p> <p>Q7: Other Data problems Time to collect data; finite and need for sufficient data.</p>
(G) Tools	<p>Questionnaire/survey (online/mail) and/or Interview (phone/person) to generate data to be used with an Access Database of responses for each respondent, data exported to MS Excel in a suitably coded manner to generate meaningful results including (but not exhaustively)</p> <ul style="list-style-type: none"> • Likelihood to choose application of control • Likelihood to choose method of control • Likelihood to use previous method of control/use new method of control • Likelihood to work with a neighbouring property to undertake control (collaboration) • Influences and reasons for choices for above • Cost of controls, both actual cost and opportunity cost
TWO	Two key questions
(H) What's New?	<p>Very little on the subject of primary producer decision making wrt feral/invasive pests</p> <p>Increase knowledge on decision making; what is known is what the "best" control is, but not how farmers decide on what controls to use nor when to undertake control</p>

(I) So What?	<p>Transferability to other invasive species of flora and fauna of concept of collaboration/cooperation</p> <p>Policy prescription/ideas for best practice in Australia</p> <p>Through improving the efficacy of feral pig control, this may help to shape policy and practice due to challenges of invasive species throughout Australia. In particular the risk of diseases spread through transmission from area to area by feral pigs and other species has economic (and environmental) impact potential, as well as damage to individual farm production and infrastructure (fence and water supplies)</p>
ONE	One bottom line
(J) Contribution?	<ul style="list-style-type: none"> • Policy and practice guidance at a number of levels to support decision making and change behaviour. • Testing and identifying the role of different decision making plans and control strategies on a theoretical basis. • Pipeline of future work: Aim for a paper, and then possibly a further PhD idea and research programme.
(K) Other Considerations	<p>Narrow yet deep scope; limit area to within a LLS area/council area; scale of properties may mean that only a few properties are needed to exhaust the area</p> <p>Collaboration with other researchers with similar topic area (CRC Invasive Animals/LLS)</p> <ul style="list-style-type: none"> • Idea: May not be needed; assistance with certain sections may be needed (ethics and model design) • Data Contacts: CRC Invasive Animals/LLS NW to help provide more contacts • Tools: Possibly need assistance with modelling of results if needing mathematical/econometric analysis <p>Risks</p> <ul style="list-style-type: none"> • No result: Medium/High; data challenges curtailing project/research • Competitor Risk: Low; new area/very little on topic <p>Obsolesce Risk: Low; Transferable to other species of flora and fauna</p>

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