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Keynote Summary: The social side of pest and disease biosecurity: reflections from Australia

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The social side of pest and disease biosecurity: reflections from Australia

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Solving problems of plant pest and disease incursions in agricultural systems is complex. The environmental factors that underpin incursions like Huanglongbing (HLB) are hard enough to understand, but biosecurity challenges are, in addition, exemplified by the fact that humans are integral parts of both the problem and solution. When science misses this important point we tend to limit our research only to 'hard' science – yet in fact it is often the case that it is not the lack of hard science that is holding us back.

So, with a focus on the "softer" social side of controlling plant pest and diseases in agriculture, it is fair to say people do two 'inconvenient' things that complicate the challenges.

One is that, quite logically, pest and disease management is rarely the number one priority for growers. Growers not only have other pressing business issues to deal with, but they also have personal lives to attend to. This is perhaps obvious – but the implication is profound. When we try to motivate growers to manage their farms for pest and disease, rather than just focusing on their attitudes specifically to pest and disease management, we need to understand what motivates them more broadly. Rather than understanding attitudes to pest and disease management, we need to focus on any attitudes and behaviours that impact on pest and disease outcomes even if those have only an indirect influence.

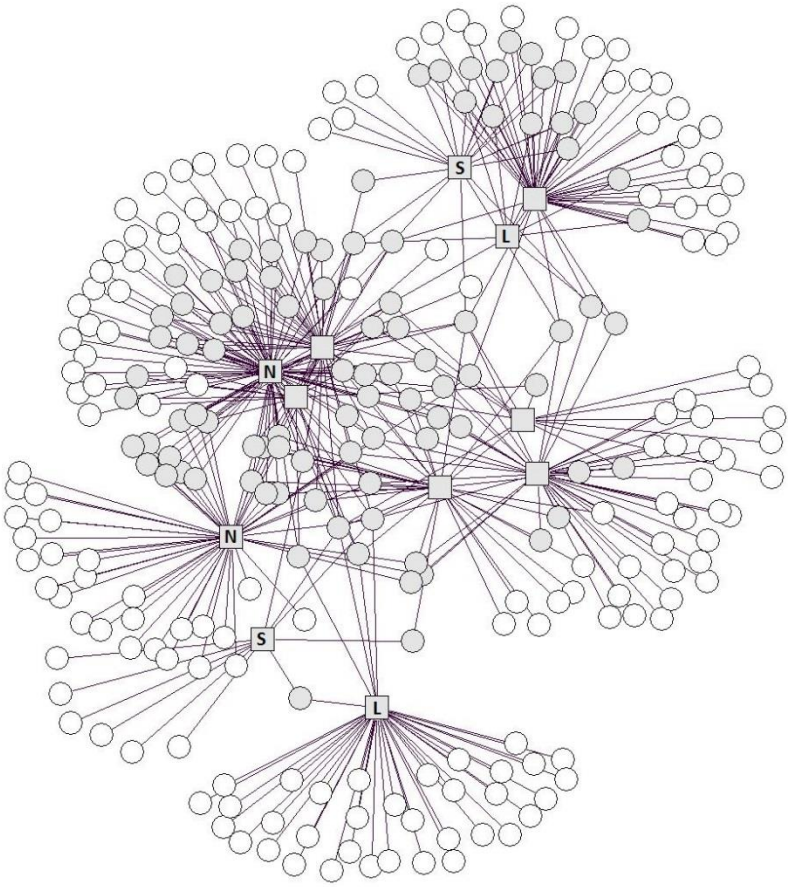

Fig. 1. Graphical representation of the complexity of social and policy interactions that contribute to decision-making for pest and disease control (taken from McAllister et al. 2017). These data show how individuals (circles) participated in the 2010-2011 Australian attempt to eradicate the Myrtle rust disease '*Uredo rangelii*' (with squares representing the working and technical groups which were part of the eradication attempt).

The second inconvenient thing all people do is to break many of the basic laws of economics. People are not strictly rational. People are not uniform. People cannot make perfect forecasts. In fact, people are much more intuitive and much smarter than that. In many context people are very efficient decisions makers. Rather than rethinking the wheel every time decisions are made, we all follow very general rules that we intuitively develop based on past experiences from across a vast range of everyday situations. We rarely rethink things – instead we use mental short cuts. This is highly efficient, but it's certainly not rational, and it is far from fool-proof.

The other important point relates to stress. As much as we try to understand how people behave and what motivates growers, the rule- book for understanding people goes out the window when they are under stress. And research has shown that during major pest or disease incursions, entire communities can face very serious health and well-being issues making behaviours even more uncertain than 'normal'.

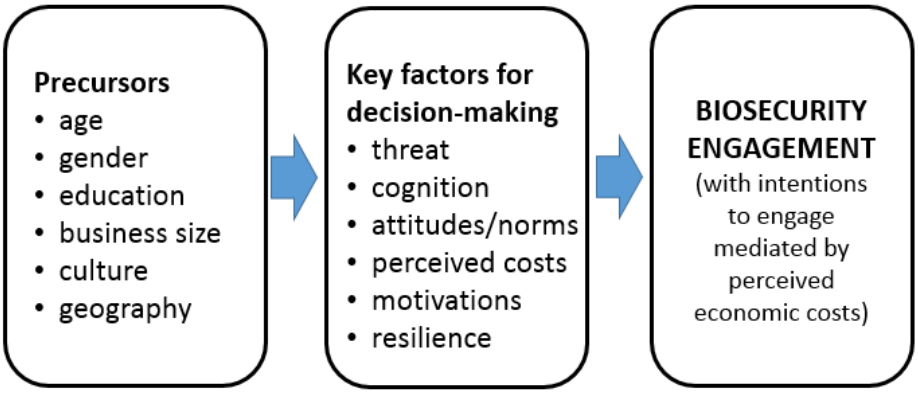

Fig. 2. Adapted from Mankad's (2016) review of the psychological, social and cognitive factors on biosecurity-related behaviour and management practice. Economics is one key part of biosecurity engagement, but individuals' long-term habits are resistant to change.

We absolutely need hard science, but we ignore social science at our peril.

Of course social science needs to do more than point out problems – it needs to be part of the solution, and there is a growing body of research that does just this:

1. Models for community engagement are needed that focus on different target groups within the agricultural system prior to any incursion. When incursions do occur – and they will – time is too critical and tensions too high to be developing relationships on the fly.
2. We need institutions to be able to adapt and balance the dual need for stability and fragility. Stability provides a steady, calm hand. But innovation and fast-fails are also needed to trial new thinking and test and incorporate new technologies into every day practice.
3. Lessons can be drawn from psychology and economics, which now have a solid body of research on how to frame communications in a way to bias behaviour. The crux is making people understand why they might cooperate on issues of area wide management, for example, is less important than achieving cooperation as an outcome. Psychology and economics can 'nudge' people toward an outcome even if understanding is low.

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