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Committee Secretary  
House of Representatives Standing Committee on Agriculture and Industry  
PO Box 6021  
Parliament House  
Canberra ACT 2600

## **Re. Inquiry into the role of technology in increasing agricultural productivity in Australia**

Thankyou for the invitation to make a submission to this inquiry.

As the Standing Committee may be aware, my recent report to the Australian Government's *Securing Australia's Future* project addressed a number of issues pertinent to innovation and technological development in agriculture. The full report may be found at:

[www.acola.org.au/PDF/SAF07/social%20and%20political%20context.pdf](http://www.acola.org.au/PDF/SAF07/social%20and%20political%20context.pdf)

I will not reproduce the report in detail here but highlight instead several key points pertinent to the Inquiry's terms of reference. These points address the social and political context for innovation as opposed to the merits or pitfalls of particular technology options.

Dealing with the terms of reference in reverse order:

### **Barriers to the adoption of emerging technology**

Key barriers include financial stress and under-investment in the agricultural sector, buyer resistance to practices perceived to be unsustainable, unethical or unsafe, and emerging private sector regulation.

#### *Financial stress and under-investment*

As many as 75 per cent of Australian farm businesses do not generate sufficient financial returns to support business growth through investment in, among other things, productivity enhancing

practices. Poor returns contribute to a vicious cycle in which under-investment is compounded by low levels of participation in agricultural education and reduced recruitment into agriculture as an occupation.

At face value, this suggests an urgent need for technologies that reduce labour demand. However, labour saving technologies may themselves reduce employment opportunities and deepen social and professional isolation for many working in agriculture. It follows that the availability of labour-saving technologies will most likely not, by itself, be sufficient to generate a virtuous cycle of productivity and income growth.

A transition from the existing model of predominantly family-run small-to-medium sized farm businesses to a corporate model with higher levels of foreign ownership could, in principle, provide more entry pathways into agricultural careers along with an injection of technology and investment capital. To date, however, there is limited evidence foreign-owned or other corporate farms are either more productive or more likely to implement innovative practices than are large family-owned farms.

#### *Buyer resistance*

Buyer resistance to agricultural products perceived to be unsustainable, unethical and/or unsafe has been a major impediment to greater use of genetically modified (GM) crop varieties and a source of serious disruption to markets for meat and wool. Government responses have been inconsistent (across both time and levels of government) varying from moratoriums and export bans to education and promotion campaigns.

Leaving aside questions of whether genetically modified food is safe, many consumers would rather not eat it and do not trust the claims of GM proponents. Public relations exercises have done as much to amplify this distrust as they have to attenuate it. Some buyers, including international food manufacturers and retailers, have treated this as an opportunity to represent themselves as champions of consumer interest by removing GM products from their supply chain. Others, similarly, have removed Australian wool.

While there is no simple solution to buyer resistance the following generalizations usually hold:

- The more moral ambiguity or scientific uncertainty surrounds a particular technology, the more important it is to pre-empt social concerns through various levels of stakeholder involvement in policy, technology design, approvals processes etc. and through earlier involvement of social scientists in the research process.
- Considerable opportunity exists to develop more demand-responsive production through concerted R&D effort to resolve known buyer concerns around animal welfare, sustainability, safety etc.

#### *Private sector regulation*

Vertical coordination of supply chains places retailers at particular risk of reputational damage associated with food safety scares, controversy over animal welfare, and so on. Retailers manage these risks through standards-based regulatory frameworks that are, particularly in overseas markets, expanding beyond the cosmetic and safety attributes of products to include social and environmental criteria.

Implementation of standards at farm level is itself an important innovation with potential to enhance efficiency, quality and market access.

However, international retailer-led standards such as GLOBALG.A.P. tend to be prescriptive rather than risk-based – stipulating the practices farmers must adopt in order to ensure they meet quality criteria and thereby narrowing the range of technology options available.

While GLOBALG.A.P. does not currently, for example, preclude the use of GM varieties it does require producers to store all GM materials separately to non-GM materials and to declare the GM status of produce to all buyers, thereby facilitating the ability of buyers to exclude GM products from their supply chains should they choose to do so.

It is also conceivable that GLOBALG.A.P. and other standards could expand their domains of concern over time and require producers to demonstrate some measure of best-practice in relation to issues such as the carbon intensity of production, regional biodiversity conservation, and so on.

### **Emerging technology relevant to the agricultural sector**

The horizon scanning intent of this Inquiry is to be applauded. ICT, remote sensing, genomics etc. all have a role to play in the future of Australian agriculture.

At the same time, the complexity of agricultural systems will ensure no one technology holds the key to transformative change. Discrete technologies such as those mentioned above must be embedded within a holistic understanding of the landscape-scale ecological and hydrological processes in which agriculture is situated.

Innovation in ‘systems management’ at higher scales is thereby as important as, and must be integrated with, innovation at the genetic, field and enterprise scales.

Operationalizing a more integrated approach to agricultural research is possible but only if at least two challenges are addressed. Suspicion among consumers to some technologies has already been discussed. Just as importantly, institutional frameworks are required that enable genuinely cross-sectoral R&D. In this respect, public research institutions such as rural R&D corporations have a crucial role to play, as do regional natural resource management groups, linking the contributions of private actors and institutions as well as the contributions of disciplines across the social and natural sciences.

### **Scope for improvements in efficiency**

In isolation, improvements in efficiency enable us to produce more of the same at lower unit cost – to cope with challenging terms of trade and maintain our price competitiveness relative to other producers. Innovation in agriculture, however, ought to be about more than this. Innovation ought to be about improving quality, addressing buyer concerns, and finding myriad other ways of adding value to Australia’s agricultural production.

Research and development absolutely should be aimed at increasing agricultural production and

productivity. Australian agriculture is well placed, in doing so, to capitalize on the shift of economic and political influence to Asia.

We cannot afford, however, simply to expand production and hope for the best. In no small way, the future prosperity of Australian agriculture will depend on its ability to proactively engage with and exceed buyer expectations. Some businesses will be able to exploit markets for products with specific environmental, cultural or quality claims. Most will find that exceeding expectations is simply a baseline requirement of secure market access. In this context, research and technology development that deals with existing buyer concerns (especially in relation to animal welfare) must be accorded a much higher priority.

More detail is available in the report referred to above. I am also, of course, happy to speak with the Committee further to clarify any or all of these matters.

Please note this submission reflects my own professional judgement and does not represent the view of James Cook University or The Cairns Institute.

Sincerely,

Prof Stewart Lockie