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19th May 2005

House of Representatives  
Standing Committee on Agriculture, Fisheries and Forestry

### **Submission to the Inquiry into Rural Skills Training and Research**

The University of New England (UNE) has a long record of involvement and leadership in rural education, tertiary training and adult education and research, commencing some 50 years ago with the establishment of the Rural Science Faculty. We continue to play a significant role in agricultural education in NSW and have a wide sphere of influence on agricultural education and research in NSW and southern Queensland and nationally through our formal collaborative agreements with CSIRO, NSW DPI and NSW TAFE and via our involvement in Cooperative Research Centres; CRC for the Australian Sheep CRC, Cotton Catchments a Communities CRC, CRC for Beef Genetic Technologies, the Australian Poultry CRC, the Viticulture CRC, CRC for Australian Weed Management, CRC for Irrigation Futures and CRC for an internationally competitive Pork Industry. The education programs (ranging across schools, VET and tertiary training) for five of these CRCs are based on the UNE campus in Armidale.

UNE led the move to the provision of tertiary agricultural education in distance mode and continues to innovate in this area to facilitate the development of education programs linking school, VET and tertiary training particularly through industry focused training initiated by CRCs and other industry sponsored programs such as the GRDC funded Grains Certificate program. Articulated links have been established between UNE and TAFE to facilitate the development of agricultural training and education in the region.

Agricultural research has also been a fundamental component of UNE since its inception and we remain a significant player in a diverse range of agriculturally related research in the agricultural and environmental sciences, social sciences and economics and law. This occurs within CRC programs but also through funding from industry.

Given this background we provide some observations and comments relevant to the four terms of reference for this inquiry.

#### ***Availability and adequacy of education and research services ...***

- It is our belief that present education services for agriculture are being rapidly eroded as resources **are too thinly spread across a large number of providers**, some of which are located in metropolitan environments rather than having close links with the agricultural sector and rural communities that would facilitate growth of adult education/extension as well as traditional tertiary training. The **location of training resources is also of vital importance in the facilitation of the pathways** between vocational and tertiary education as a large proportion of the vocational sector are training “on site” or in some form of “distance” mode.

- The increasing separation of the average member of the Australian community from agricultural production and processing is linked to increasing negative images associated with agriculture whether the environment, water, animal welfare, genetically modified food or chemical pollution. **The end result of such community perceptions is a decreasing pool of students.** This declining pool has also been exacerbated at tertiary level by the decline in science student numbers and this is probably particularly significant for the training of people for the processing sector.
- The declining interest in agriculture over recent years is starting to be seen as a skills shortage in the scientifically trained labour capable of working from first principles to problem solve and who are adaptable to a wide cross section of agricultural sectors/industries. The competency based training which has been the focus of industry demand in the last decade or so does not provide the flexibility/adaptability to move with or between rural industries without further training and the **capacity to retrain via links to tertiary education providers is clearly necessary.** The popularity of certificate programs initiated by CRCs (eg Cotton and Beef) is clear evidence that there is a demand for such training and that the capacity to **retrain within an industry context** with links to universities and to recent research is a key issue in this popularity.
- The present changes in land ownership are rapidly moving agriculture toward an ‘industrial’ framework with land ownership vested in corporate rather than family control. For land remaining in private ownership it is likely that these individuals will be ‘part-time’ farmers. Such changes are also likely to effect the demands for rural skills in the future with an **increasing need for integrators/managers** and a technologically competent workforce for large intensive farms and also an **increasing need to provide extension advice** to the smaller part-time land holders and to provide an infrastructure to ensure sustainable land management.
- There are a number of models that have potential to foster the development of pathways between the vocational sector and tertiary programs. For example at UNE we have developed:
  - a) Certificate and Diploma packages linked to CRC and industry funded programs for research and tertiary education which are responsive to industry requirements but also to the need to provide a scientific framework for training;
  - b) Articulated degrees with the VET sector: for example the Bachelor of Technology which provides advanced standing for the TAFE advanced diploma and allows for the completion of a degree with a further 18 months of training (all potentially completed in distance education mode); and
  - c) external part-time delivery of diploma, advanced diploma and degree programs that are all fully articulated.
- Research training is best done in an environment where there are interactions with practising agricultural scientists (eg CSIRO and NSW DPI) and across disciplinary opportunities created by a Faculty with industry involvement. The most effective education and training at all levels is done in a context of “research led” education. It is also clear that **there is a need for a critical mass of individuals in any one discipline to facilitate an effective and efficient team of postgraduate students and researchers.** Such teams develop agricultural specialists with the capacity for independent, skills-based problem solving rather than individuals whose decisions are ‘recipe’ based. It is our belief that current changes in tertiary education are facilitating the loss of critical mass in many agricultural disciplines and that there is a real risk that assessment of institution-wide research performance may well threaten universities whose research focus is primarily agricultural and natural resource focused. Soil science was specifically mentioned in the terms of reference and is a good case in point with the critical mass of soil scientists being eroded at all tertiary institutions teaching agriculture.

### *The skills need of agricultural industries in Australia...*

We believe the skills base for agriculture as it moves toward the middle of the 21<sup>st</sup> Century will need to lie in “smarter agriculture” in the following areas.

- Management and business skills will need to be linked to the capacity to integrate knowledge across the science disciplines and answer the question “why” rather than “how”. Linked inexplicably with these skills will be environmental management. **The need then will be for rural and agricultural scientists with inter-disciplinary and integrative training who are flexible, broad based and have an environmental awareness.** However, there must be care taken to ensure that the teaching of enabling sciences (the capacity to answer the ‘why’ question) is not lost in the desire to become systems focused.
- **Food and fibre processing will require an increasing scientific skills base** – not necessarily trained as traditional tertiary agricultural students but possibly trained in an environment where they develop an understanding of the production of products as well as the science of processing the product post farm gate. This will help in value-adding our agricultural commodities for increased export opportunities.
- **Other technologists/scientists with a background in discipline areas such as biotechnology and precision agriculture** and the application of technology to environmental protection will be needed. Again the traditional training base will move more toward the “enabling” sciences but are probably best taught in the context of an agricultural environment so that those trained understand the rural issues and consequences of their work.
- There will also clearly be a need for people trained specifically in the skills of agribusiness and marketing, rural and environmental policy and the social sciences related particularly to rural issues.

Agricultural industry has traditionally, often of necessity, had a relatively short term focus and consequently training needs have often been focused on the immediate requirement to “get a job done” rather than on the generic skills needed to manage agriculture of the future. Increasingly organisational structures for agricultural industries are providing leadership (for example through CRC training programs and industry advisory board groups) to identify the training needs longer term. The short term imperative has driven an emphasis on competency based training but if “smarter agriculture” is the way of the future then it is likely that the need will be for **people trained to work from first principles and therefore be adaptable to a range of industries**, all of whom will need inter-disciplinary managers with the capacity to oversee technology specialists who will provide services not necessarily just to agriculture (eg computer technology).

Researcher training is probably one area where industry will not necessarily identify future needs. The reality is that a high proportion of the agricultural research population are from the “baby boomer” generation and that in most areas of agricultural research **there has been little succession planning to provide either full time researchers or tertiary teachers for the future.**

### *The provision of extension services and advisory services to agricultural industries...*

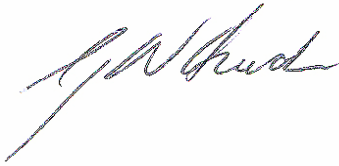
- Agricultural extension in Australia has historically been based within State agricultural departments but this support has been progressively declining over the last two decades and private companies have been increasingly playing a significant role in extension and advisory services. **It seems clear that there is a desire amongst State departments and industry to find more effective models for extension** and we would suggest that the “Land Grant” Universities model of the USA provides many attractive characteristics that might be considered.

- The basic requirement would be for **infrastructure to allow the establishment of closer links between education, research and extension providers within major centre/s**. This would provide a focus for the rural community to seek information but also facilitates the exchange of information such that research is in context and advisory staff and practitioners both have access to educational expertise and to the most recent research. Of some importance in such a model would also be infrastructure that provided modern communication portals to facilitate information flow. At UNE we have been gradually working toward such a model with development of close links to CSIRO, the establishment of the Primary Industry Innovation Centre with NSW-DPI, the presence of NSW–DIPNR on campus along with NSW DPI Beef Centre. The sharing of a campus will facilitate collaboration of research programs, resource sharing and create opportunities to develop new advisory models and to train graduates in the skills associated with extension.

*The role of the Australian government in supporting education, research and advisory programs ...*

We see two key roles for the Australian government:

- The provision of **infrastructure support that will facilitate the sharing of campus resources for education, research and advisory services** in rural centres and funding to facilitate the establishment of closer links between all elements. This will inevitably involve funding support to maintain education and training ‘in-context’ in a demographically declining population and within a threatened environment.
- The development of **mechanisms to reverse the present trend of a declining interest of School leavers in agriculture and science related fields** particularly those with a background in science capable of providing the scientific “human capacity” for the future. Provision of targeted scholarships at various educational levels to attract students to or to remain in ‘the bush’ (equivalent to the present rural medicine initiative) may be one particularly valuable option.



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