



Australian Society of Horticultural Science Inc.

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SUBMISSION TO THE ENQUIRY INTO RURAL SKILLS TRAINING AND RESEARCH

Recommendations

- 1. Promote an awareness in the general community, and in particular primary and secondary school students, of the importance of horticulture/agriculture and horticultural/agricultural science to the economy of Australia and to the health, well-being and quality of life of Australians.*
- 2. Review the quality of science teaching, and the qualifications of science teachers, in primary and high schools and upgrade these, providing rewards, status and incentives for better qualifications, so that students will be instilled with a love of science and inspired to pursue a career in science, including horticultural/agricultural science.*
- 3. Coordinate the different levels and types of horticultural education to ensure that their individual objectives are defined to more effectively meet the training and knowledge needs of students by the efficient delivery of complete and appropriate courses, avoiding wasteful duplication.*
- 4. Revise the horticultural/agricultural curriculum to ensure that content is appropriate to current needs and that areas such as processing, marketing and value-adding are adequately catered for.*
- 5. Review the accessibility of education and training options in horticulture/agriculture to ensure that industry participants have the opportunity to acquire and upgrade their skills and knowledge through appropriate on-going educational opportunities.*

Although the following submission concentrates on issues affecting horticultural education, the issues are equally relevant to the broader issues of rural skills training and research.

Australia's expanding horticultural sector

This inquiry is timely, particularly for the \$6.4 billion horticultural sector that depends on highly developed skills and innovation to compete successfully in a competitive global market. Horticulture in Australia is extremely diverse and comprises fruit, vegetables, nuts, nursery, extractive crops, cut flowers and turf. Total horticultural exports in 2002/03 were \$778 million, having grown dramatically through better performance in existing markets and access to new markets. It is the fastest growing industry in agriculture with 17,273 enterprises. Horticulture employs 64,000 people, 20 per cent of total employment in agriculture. Importantly, horticultural products are essential for good health and nutrition. If other horticultural industries are to emulate the successful expansion of the Australian wine and macadamia industries, for example, an adequate supply of well trained horticultural scientists and technicians is needed to underpin the required innovation, productivity, efficiency and sustainability of

production in a way that protects the nation's natural resources and the amenity value of the environment.

The contribution of horticultural science

Investment in horticultural education, and rural education generally, underpins our capacity to restructure our rural economy to effectively capitalize on the wealth generated from primary resources. The underlying strength and export potential of Australia's horticulture provides the opportunity for improved productivity, profitability and stability of the rural economy. Previous investment in research, development and extension have paid handsome dividends and contributed to vibrant growth of the horticulture sector.

The development and adoption of superior technology and management systems, and better marketing strategies, has enabled Australian farmers to produce and market high quality produce, without subsidy, on highly competitive world markets, despite heavily subsidized competition. A concerted research effort is essential to maintain, and enhance, this capacity. Rural research is a profitable investment and agricultural exports are crucial in maintaining our balance of payments and our international competitiveness.

Current provision of horticultural/agricultural education and training

The McColl Report of the Review of Agricultural and Related Education (1991) provided an overview of the wide range of education providers in Australia and identified the need for a coordinated, national focus. Many of the enormous changes in the farming sector identified in the McColl report have, in fact occurred. Farms have been amalgamated, resulting in fewer, larger, commercial units. They operate in an environment of rising costs and declining margins due to more open, volatile world markets. Although the ability to manage climatic risk may improve, the vagaries of climate will always challenge the farming sector. To succeed, a more professional business approach to farming is required, being more demanding intellectually, technically, financially, environmentally and socially. There is an increasing need for an appreciation of the underlying scientific principles behind new technology and its adoption, and a greater capacity to analyse financial implications and risks. The demand for better knowledge and skills for farmers and for their workers, advisors, consultants and suppliers is appreciated by all sectors of the agricultural sector. The conclusions in the McColl report remain relevant today but agricultural education has not responded adequately to the changes that have, and are, occurring.

University education. Prior to 1988, Australian universities offered general, applied degrees in agricultural or horticultural science, focusing on animal and plant sciences and economics with a large research component with emphasis on postgraduate training, with some limited specialization. Subsequently, many agricultural courses have become part of a broader set of science offerings, losing their identity and focus. Consequently, they do not provide a general appreciation of component disciplines and their practical integration which has traditionally been the strength of training in agricultural science.

The lack of specialization limits career opportunities in the new areas of science such as biotechnology and molecular sciences and this is of some concern, potentially constraining the contributions that might be made to benefit our rural industries. The challenge is to integrate and balance specialized science subjects into an complete, applied package that has relevance to the demands of a modern agricultural sector that, itself, must balance natural resources, production, new technology, a complex demand-supply chain, finance, and successful systems management.

Agricultural Colleges. Agricultural Colleges were established before the universities and made a valuable contribution to the education and training for primary producers, although they were not funded to carry out research. These Colleges have evolved into universities (or have been amalgamated with existing universities) but still focus on education and training, providing degrees in applied science and associate diploma courses, often with additional offerings such as business management, environmental impacts of agriculture, food technology and processing. Despite this, areas such as food technology and processing and value adding are still inadequate. These institutions now provide postgraduate training and carry out some research and are complementary to, if not integrated with, the agricultural science programs of the older established universities. McColl (1991) recommended improvements in this sector, including better strategic planning, more external input into course development, more emphasis on sustainability and value-added industries, a higher standard of teaching and better coordination between the wide range of providers. Although some of these issues may have been addressed to some degree, there is probably still a need for further improvements.

TAFE. TAFE programs focus on operator and technician certificate courses and associate diplomas for middle management, together with a variety of short courses. The flexibility of delivery and widespread availability of these courses provides desirable flexibility but offerings in agriculture/horticulture might be sub-optimal in some areas.

Schools. The availability of courses in agriculture and agricultural science varies widely and is generally low. There is a trend to reduce vocational agriculture programs and integrate agriculture into other subject streams. Relatively few high schools are designated as agricultural high schools. In many primary schools, agriculture forms a small integral part of the curriculum. Overall, there is a need to expand an understanding of the contributions made by agriculture and horticulture to our health, well-being and quality of life in our schools curricula.

The concern about many science teachers not having any science qualifications, either applied or basic, could be having a negative effect on the awareness by students of the exciting area of science generally. This needs to be redressed and qualified science teachers who have a genuine passion for science should be offered incentives to teach in schools and inspire school children to specialize in science, including agricultural and horticultural sciences.

Declining enrolments in horticultural science education

Little has changed since the Stoughton (1962) observation that “horticulture and horticultural education have tended to be treated as a relatively minor part of agriculture and due weight has not been given to the importance of the industry”. Despite the considerable contribution horticulture makes to the economy and well-being of Australians, all the indicators suggest declining interest in tertiary education specializing in horticulture, despite a larger number of providers of named horticultural degrees at bachelors level and above than in 1962.

Universities providing horticulture degrees are:

- *Charles Sturt University (BHort)
- *University of Adelaide (BHort)
- *University of Melbourne (Burnley) (BHort)
- University of Queensland (Gatton) (BAppSci (Agr and Hort))

- University of Sydney (BHort Sci)
 - University of Tasmania (BAppSci(Hort))
 - *University of Western Sydney, Hawkesbury (BHort)
 - *University of Western Australia (BHorticulture and Viticulture)
- *Separate Degree or specialising in Viticulture and Oenology

Universities providing horticulture options within other degrees are:

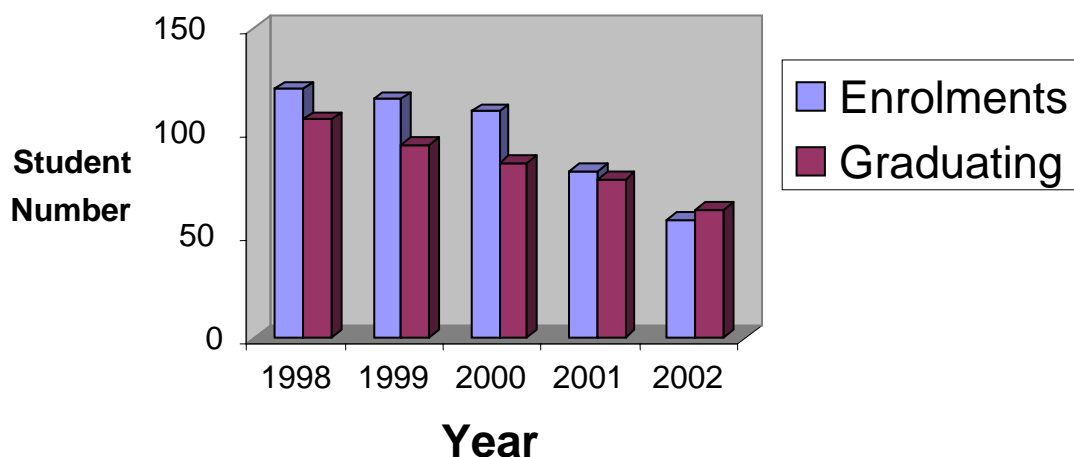
- University of Technology Sydney (Environmental Science)
- University of Sunshine Coast (Agricultural Ecology)
- University of New England (Agriculture)
- University of Newcastle (Postgrad only)
- Curtin University

There has been relatively little change in the number of Universities providing degree training in horticulture over the past decade. In fact, most of these universities have experienced a decline in student numbers, despite low entry scores that are now applied. These entry scores reflect low demand rather than the intellectual demands of courses. Reasons for this include the undeserved poor image of horticulture, perceived poor career prospects and relatively low salaries, changed entry requirements by the University of Melbourne, doubling of HECS in mid 1990's but, perhaps more importantly, the shortage of students studying science at school. This contributes to the problem of attracting good students to study horticultural science.

A meeting of the Deans of Science Faculties in Australia, considering this problem recently, found that most of the teachers teaching science subjects at high schools were not, themselves, trained in science. It is generally agreed that many who have pursued careers in science were inspired to do so by good, enthusiastic science teachers at school. If young Australians are not being exposed to science teachers who have a passion for science, it is understandable that they are not inspired to pursue a career in science. Non-science trained teachers who teach the science curriculum but lack the passion for the subject may be doing a disservice to their students and to the development of a progressive and innovative workforce. Immediate steps to rectify this situation are likely to pay big dividends in enhancing our scientific capabilities and the flow-on benefits to our primary industries, including horticulture.

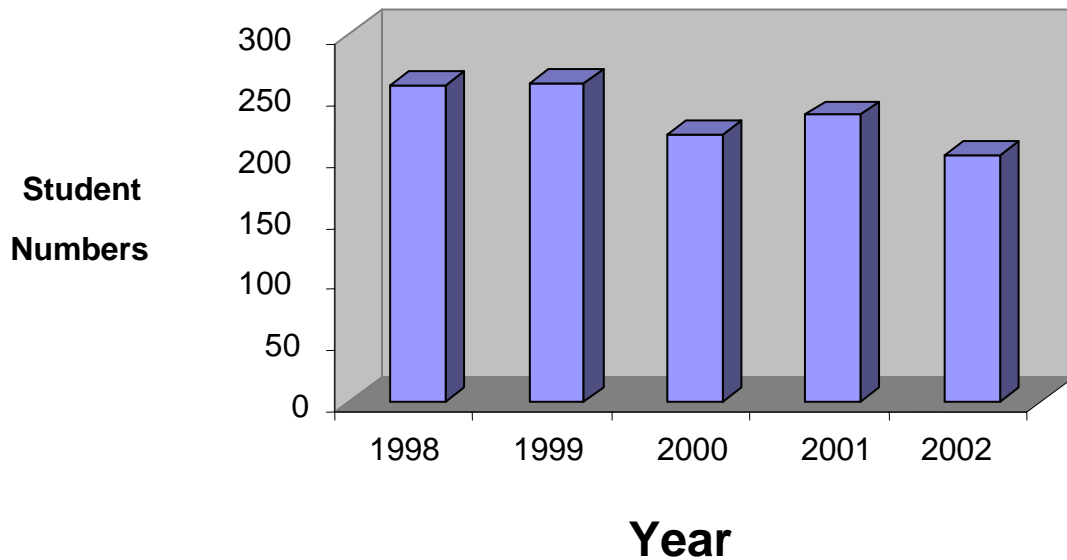
Undergraduate Students in Named Horticulture Degrees

(Universities of Melbourne, Western Sydney, Adelaide, Sydney.)



Total Students (undergraduate + postgraduate) Enrolled in Horticulture

(Universities of Melbourne, Western Sydney, Adelaide, Sydney, and Queensland).



University responses

The lowering of entry score requirements due to lack of demand in horticulture; (and agricultural) courses has an adverse impact on the image of the discipline which further depresses demand. This situation is exacerbated by frequent changes to courses and the failure to effectively communicate the nature of the changes and how they will affect the prospects for meaningful employment.

Some universities have responded to declining student numbers by developing separate degree courses in Viticulture and Oenology to cope with the demand in that area while some have developed strong external programs and some have encouraged students in other related degrees to take horticulture electives to boost numbers in class and make teaching viable.

Most universities would like to see an increase in horticulture degree enrolments back to the levels experienced in mid 1990's but, realistically, many have adjusted quotas down in response to the low demand. Others are close to target for total undergraduate load e.g. the University of Queensland is maintaining strong numbers and overall the School of Agriculture and Horticulture is growing. Research postgraduate enrolments have increased at some universities but has and remained steady for others.

The future for horticultural education is impacted by restructuring caused by financial pressure from the Federal Government. Consequently, amalgamation of Departments has led to the loss of horticultural identity. In fact, the viability of horticultural courses is being reviewed by some universities. Some courses already subsumed into other degrees, and expansion into postgraduate training, particularly for international students, is occurring in some universities.

If these trends continue and enrolments in horticulture do not improve, cuts in staffing levels will be inevitable. The potential for horticultural science to contribute to the economic development of innovative horticultural industries will be seriously compromised if financial pressure results in a reduction of specialist subject areas like horticulture. The provision of generic courses with some specialisation at end of course will be a poor substitute for comprehensive training in horticultural science.

There is a need some rationalization, cooperation and better coordination between institutions providing education in horticultural science. Electronic communication provides opportunities to achieve this without adversely affecting the quality of the education provided. However, competition between institutions is intense and reforms are unlikely in the absence of incentives and clear direction.

Attracting more students into horticultural science

The key to attracting more students into horticultural science is ignite an interest in horticulture in high school, or better still in primary school, by introducing students to the diverse range of jobs available in horticulture and by employing specialist science-trained teachers who are passionate about science and its contribution to making a better life for everyone, in all aspects of life. Financial incentives to attract the best science teachers into our schools would provide an excellent return on the investment by enhancing the capacity of our workforce through scientific solutions and innovation. It would also enhance public understanding of the benefits of a strong scientific base.

The new Zealanders have produced a video “Pick of the crop” that features NZ horticulture and the diverse range of jobs available, including lifestyle horticulture. A concerted, sustained program of education on the opportunities in horticulture, as well as in other aspects of rural science, commencing in primary schools and extending into high schools, would be ideal. Celebrating the achievements made by science to horticulture and championing high achievers and their contributions should provide inspiration and incentives for a career in horticultural science. Practical workshops and hands-on projects for high school students would be effective, e.g. linking with local Councils in providing landscaping experience for teenagers.

Effective promotion of horticultural vocations in schools would require assistance from industry. Career options are very good but these need to be highlighted to change perceptions of horticultural science as a dynamic, rewarding career providing unlimited opportunities to make a positive impact on our economy and our quality of life through better nutrition and health, and enhanced community amenities for sport and relaxation. In addition to the therapeutic value of “hands on” horticulture, there is a need to increase the public awareness of horticulture as a science that has the potential to enhance our lives economically, physically and mentally. There is a need to provide a continuous stream of “good news” stories about horticulture to counteract the poor publicity about rural Australia and to develop well-supported careers packages for schools.

Finally, a breakthrough in national promotion, that caused youth to see horticulture/agriculture as trendy, popular and even glamorous, would make a real difference to student numbers at all levels. For example, promotion by the star of one of the popular television garden renovation of careers in horticulture.

Access to training in horticulture

Because of the separation of the agricultural sector from the large population centres, there are difficulties with accessing and resourcing agricultural education. This separation also exacerbates the lack of understanding by the urban population of issues

facing agriculture and rural communities. It complicates the design of education and training to meet the needs of participants in the agricultural sector, and makes it more difficult for them to be involved in setting the agenda.

The agricultural sector increasingly requires the application and management of complex and rapidly changing technology, rapidly changing and complex processing and handling systems, and sophisticated financial management and marketing systems. All this needs a highly skilled, innovative and versatile workforce not only directly involved in production, but also extending throughout the demand-supply chain. The capacity to manage change throughout this chain will have a substantial impact on efficiency, effectiveness and prosperity of rural industries. Investment in education and training is essential for these objectives to be achieved, and it is essential that these objectives are achieved because of the importance of rural industries to national prosperity.

Building smarter horticulture

Agriculture is fundamental to the Australian economy. An important element in the enhancement of the horticultural economy is the promotion to the general public of the image of horticulture (and science generally) and its contribution to our economy and our quality of life. Another is the development of business and marketing skills of horticultural entrepreneurs who should be empowered to influence the direction of their industry. To achieve this, educational opportunities must be improved at all levels, with improved access for rural people, including distance education and flexible courses to suit the needs of the industry.

Agriculture, including horticulture, faces difficult times, not only from market and cost pressures, but also from an inability to train the next generation of practical researchers, farmers and those who support and advise them. The future directions for agricultural education must be driven by a thorough understanding of the demands of all the various sectors of the industry, not just supply. The agricultural education sector must, ultimately, focus on the needs of industry.

Further Reading

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