

REVIEW INTO AGRICULTURAL EDUCATION AND TRAINING IN NEW SOUTH WALES SUMMARY REPORT



JULY 2013



INTRODUCTION

The Minister for Education, the Hon Adrian Piccoli MP, and the Minister for Primary Industries, the Hon Katrina Hodgkinson MP, announced the terms of reference for an independent *Review into Agricultural Education and Training in New South Wales* in July 2012. The purpose of the Review is to consider the appropriateness of agricultural education and training programs in the NSW school and tertiary sectors, the promotion of career opportunities and workforce needs in the agricultural sector, and how NSW Government agricultural education, training and research institutions and other facilities could be best positioned to meet future industry needs.

The Review has been conducted by Professor Jim Pratley, an eminent research professor of agriculture at Charles Sturt University, and supported by a Reference Group. It has been informed by extensive discussions with and written submissions from agriculture and education sector stakeholders.

The Review makes recommendations for both Government and industry. It identifies incremental actions that together have the potential to deliver transformational change to agricultural education and training in New South Wales.

Key findings and recommendations of the Review are summarised in this document. The full report of the *Review into Agricultural Education and Training in New South Wales* is available at www.dec.nsw.gov.au

THE AGRICULTURAL SECTOR

The report defines 'agriculture' as the whole food and fibre value chain, from the pre-farm gate supply sector to post-farm gate processing and marketing. For the purposes of the Review, it includes horticulture, aquaculture and forestry.

The report advocates the development and pursuit of a 'vision' for the future of agriculture in Australia, to promote greater commonality of purpose in a sector that is currently fragmented and to provide greater direction for meeting future agricultural education and training needs.

INDUSTRY RECOMMENDATION 1

A representative committee of the agricultural sector undertakes, or has undertaken, the development of a vision for the sector, and the associated mission statements, in order that the sector can move forward with common purpose to position it well for the opportunities and challenges ahead.

INDUSTRY RECOMMENDATION 2

A representative committee of the agricultural sector undertakes, or has undertaken, a strategic analysis of the internal and external drivers that influence the delivery of the vision.

THE ROLE OF AGRICULTURE

The report notes that agriculture is a major contributor to the Australian economy through its productivity, employment generation and role in earning export income.

Agricultural production contributes over \$40 billion to the Australian economy each year and generates around 10% of export revenue through commodities such as barley, beef and wool. It is estimated that around 1 in 6 people in the Australian workforce is employed in the sector.

In New South Wales, primary production is worth around \$9 billion annually. The major commodities for New South Wales, in terms of gross value of production, include wheat, cattle, wool and horticulture.

Ensuring an appropriately skilled workforce is critical to maintaining and improving our agricultural productivity and global competitiveness. The report particularly considers some key sectors including the cotton and rice industries, aquaculture and forestry.

The cotton and rice industries in New South Wales are recognised as operating at world best practice in terms of production and environmental management. They are also important for regional employment and export earnings.

Aquaculture is the fastest growing primary industry in Australia. In New South Wales, aquaculture is practised in fresh, estuarine and marine water, using intensive and extensive farming production systems. Oysters are the most important aquaculture species in New South Wales, with annual production valued at around \$40 million. A key challenge is ensuring that the industry develops in an environmentally and economically sustainable manner.

Australia has around 113 million hectares of forest available for timber harvest, with about 20 million hectares in New South Wales. However, the value of Australia's wood product imports is nearly double the value of its exports, so there is scope for renewal and promotion of this industry.

AGRICULTURAL EDUCATION AND TRAINING

The report provides an overview of the education and training system in New South Wales, from primary school through to vocational education and training (VET) and higher education, and its role in delivering agricultural education and training.

The report notes that there are low levels of qualified workers, especially university graduates, in the agriculture sector. Current NSW Government reforms to VET and targets for participation in higher education provide an opportunity to increase qualification levels in the agriculture workforce, although there are particular challenges associated with promoting participation by Aboriginal students and students from regional and rural communities.

While primary school students do not study agriculture as a distinct subject, the curriculum allows students to gain an understanding of plants and animals and their growth and care. By the end of primary school, students should have the basic literacy, numeracy and technology skills that prepare them to study courses such as Agriculture and Primary Industries at secondary school.

On completing secondary school, students may apply for entry into university courses, undertake VET qualifications, or enter the employment market. Decisions about which career field and path to pursue are influenced by advice from a range of sources including parents, friends, teachers and career advisors.

The Review found that some teachers and students expressed negative views about agriculture, and that some career advisors discouraged students from pursuing careers in agriculture due to perceptions that agriculture does not offer a secure career path. This emphasises the need for the agriculture sector to actively promote itself, and for there to be improvements in training and professional development for career advisors.

GOVERNMENT RECOMMENDATION 1

A review into careers advice provision in New South Wales Schools be undertaken to ensure students are provided with well-informed advice on possible careers and pathways.

GOVERNMENT RECOMMENDATION 2

New South Wales school systems, schools and TAFE NSW Institutes establish an 'Agriculture and Food Week' within the annual school year to celebrate and appreciate the role that agriculture and food make to the health, wealth and wellbeing of society.

AGRICULTURE IN PRIMARY EDUCATION

The report addresses a range of issues related to the primary curriculum.

The Review notes that while Key Learning Areas in the primary curriculum have defined outcomes and Foundation Statements that set out expectations of student achievement at each stage, there does not appear to be an overarching statement about the purpose of the primary curriculum as a whole. To address this gap, the Review recommends the development of a clear and authoritative statement on the importance of teaching about agriculture in primary school, along with guidance for teachers about promoting students' understanding of agriculture through the primary curriculum.

While there are many opportunities in the primary curriculum for learning about agriculture and the primary industries, teachers need access to better resources and training. The report advocates supporting a range of approaches including positive stories for young children, class exercises, excursions and use of smart technology. If teachers have access to quality teaching resources then they can engage students and help them develop an interest in agriculture which can be maintained into secondary school and beyond.

Agriculture is an application of science and, therefore, science instruction is critical to building students' knowledge and understanding of agriculture. The Review found that the quality of science teaching varies across schools, and that primary teachers may feel uncomfortable teaching science because they do not have the requisite knowledge or training in the field, or access to resources.

PrimaryConnections offers a portfolio of high quality curriculum resources that focuses on the teaching of science in primary school through student enquiry. Unfortunately, there are currently no agriculture and food units in the collection.

Primary Industries Education Foundation (PIEF) is a not-for-profit organisation established by the agriculture sector to coordinate agricultural education activities and arrange the development of quality teaching resources. The Review recommends that the sector continues to support PIEF, and that PIEF establishes strong links with PrimaryConnections to allow agriculture and food units to be generated and accessible to teachers.

GOVERNMENT RECOMMENDATION 3

The Board of Studies NSW develops a 'Statement on teaching about agriculture in primary school', including guidance and advice for teachers about Key Learning Area opportunities and availability of resources.

GOVERNMENT RECOMMENDATION 4

The NSW Institute of Teachers, New South Wales universities and school authorities initiate a review of the training and ongoing professional development of primary teachers in science, including agriculture and food, to ensure that primary teachers have the confidence, sufficient expertise and up-to-date knowledge to deliver quality science education in schools.

INDUSTRY RECOMMENDATION 3

The Cooperative Research Centre for Plant Biosecurity commissions the writing of 'Cactoblastis saves the farm'.

This is the story of the introduction of the weed, prickly pear, originally as a garden plant. Its spread resulted in massive loss of agricultural production in eastern Australia. The introduction of the Cactoblastis moth enabled the control of the weed and represents a world class example of biological control. It is a story not unlike that of 'The Very Hungry Caterpillar' but has the moral of biosecurity and the value of scientific endeavour.

INDUSTRY RECOMMENDATION 4

Primary Industries Education Foundation (PIEF) undertakes to retain liaison with PrimaryConnections with a view to the generation of teaching resources in agriculture and food for primary schools.

INDUSTRY RECOMMENDATION 5

PIEF be recognised as the portal for agricultural education resources by the industry sector and by the generators of educational resources in agriculture and food. All resources so generated should be deposited or registered with PIEF and necessary links identified.

INDUSTRY RECOMMENDATION 6

PIEF undertakes the responsibility for ensuring that Scootle is adequately resourced with relevant teaching resources on agriculture and food.

INDUSTRY RECOMMENDATION 7

NSW Farmers Association works with New South Wales schools to establish a network of cooperating producers to link particularly with metropolitan schools through smart technologies.

AGRICULTURE IN SECONDARY EDUCATION

The report examines a broad range of curriculum and delivery issues for Agriculture and related subjects in secondary school.

Agriculture is taught in about one third of public secondary schools and in many independent and Catholic schools. In those schools, agriculture is usually covered in an 8-week block period within the mandatory subject of Technology in either Year 7 or Year 8, and is available as an elective in Years 9 and 10 in Agricultural Technology, Food Technology, Industrial Technology and/or Marine and Aquaculture Technology. In senior secondary school, Agriculture and/or Primary Industries may be studied, with Marine Studies offered by a small number of schools.

To ensure that student engagement with agriculture is maintained in early secondary school, the Review suggests expanding the teaching of agriculture in the following ways:

- Delivering agriculture, food and fibre options within Technology in both Year 7 and Year 8 in schools where agriculture is already taught

- In other schools, encouraging teachers to select agriculture, food and fibre options with the support of quality resources
- Promoting the use of agricultural content to enrich a range of subjects including Geography, History and Mathematics.

In addition, the Review recommends including compulsory teaching of agriculture as part of Technology.

In Years 9 and 10 there is also scope for inclusion of agricultural examples in subjects such as Science, Geography, History and Commerce. There are similar opportunities in many subjects in Years 11 and 12, but teachers without agricultural expertise need the support of quality teaching resources.

The Review found that there is scope for improving HSC study options for students with strong vocational and professional career interests, and for updating the curriculum for Agriculture and related subjects to support future workforce needs. The opportunity to encourage more Aboriginal students to study Agriculture, with a view to further education, training and employment opportunities, was noted.

Difficulties with attracting suitably qualified agriculture teachers were reported during the Review, although detailed data on the qualifications of teachers were not available. To ensure strong depth of expertise in Agriculture and Primary Industries, a review of teacher qualifications is recommended.

There are four specially designated agricultural high schools in New South Wales: Farrer Agricultural High School, Hurlstone Agricultural High School, James Ruse Agricultural High School and Yanco Agricultural High School. Designation as an agricultural high school implies that students will receive a strong grounding in agricultural production to an advanced level, and the highest quality agricultural education is provided.

The Review found that:

- Agricultural high schools should have specific references to agricultural education in their mission statements
- Field equipment needs to be updated to reflect modern agriculture
- Agricultural high schools need flexible budgeting and staffing arrangements to accommodate farm and residential operations
- There would be benefits in the agricultural high schools working together to address common challenges and to attain joint status as a Registered Training Organisation (RTO)
- There is scope to leverage support for agricultural high schools through regular contact with school alumni.

The Review also recommends that the agricultural high schools directly appoint agriculture teachers, given the importance of these roles in these schools, and that the head teachers of agriculture form a network as leaders in agricultural education and training.

The Review found that there is a gap in the coverage of agricultural high schools in central New South Wales and proposes the designation of an agricultural high school in Dubbo. In addition, the Review recommends the identification of 'lighthouse' schools to provide further leadership in agricultural education and training across the state, and greater use of NSW Department of Primary Industries research centres for education purposes.

GOVERNMENT RECOMMENDATION 5

In the teaching of Technology in each of Years 7 and 8 of secondary school, at least one content area be based on agriculture, food and fibre.

GOVERNMENT RECOMMENDATION 6

In the context of the implementation of the Australian curriculum in the senior years of schooling, the Board of Studies NSW considers the potential for students with a clear interest in agriculture to package a set of study options that better target vocational and professional career opportunities in that field.

GOVERNMENT RECOMMENDATION 7

The NSW Institute of Teachers undertakes a review of the qualifications of teachers in Agriculture and Primary Industries to determine future directions in recruitment to ensure strong depth in expertise in these areas.

GOVERNMENT RECOMMENDATION 8

The agricultural high schools in New South Wales be considered 'specialist schools' for education and training in Agriculture and Primary Industries for secondary students. These schools should:

- a. Encourage all students to study Agriculture and/or Primary Industries in senior secondary school
- b. Review their mission statements to ensure that agricultural education is strongly identified as a designated educational outcome for their students and
- c. Utilise the flexibility provided for staff appointments to appoint directly specialist agriculture teaching staff because of their pivotal role in the reputation and leadership responsibilities of the school.

GOVERNMENT RECOMMENDATION 9

An Agricultural High Schools Forum be established comprising the Principals of agricultural high schools and officers of the NSW Department of Education and Communities. Issues for consideration should include:

- a. Professional development needs
- b. Management of agricultural equipment
- c. Residential accommodation policies, management and staffing arrangements.

GOVERNMENT RECOMMENDATION 10

Agricultural high schools give consideration to establish and maintain, where they do not exist, an email-based alumni network for school promotion and reconnection with potential supporters.

GOVERNMENT RECOMMENDATION 11

Head teachers of agriculture from the agricultural high schools and VET providers form a network to develop a program of actions that contributes to leadership in agricultural education and training.

GOVERNMENT RECOMMENDATION 12

The NSW Department of Education and Communities considers Registered Training Organisation (RTO) status for the combined agricultural high schools.

GOVERNMENT RECOMMENDATION 13

The NSW Department of Education and Communities explores the options for the designation of an agricultural high school in central New South Wales, such as Dubbo. Such school would need to be near to TAFE training facilities and would need adjunct accommodation facilities for females and males.

GOVERNMENT RECOMMENDATION 14

The NSW Department of Education and Communities identifies a range of lighthouse schools state wide that support good practice in curriculum delivery, student engagement and career promotion in Agriculture and Primary Industries.

GOVERNMENT RECOMMENDATION 15

The NSW Department of Education and Communities undertakes further consultation to develop partnerships that encourage more Aboriginal students to access agricultural courses, further training and related employment opportunities, including through Opportunity Hubs.

GOVERNMENT RECOMMENDATION 16

The NSW Department of Primary Industries' Research Centres establish an annual forum with regional agriculture teachers to explore and plan activities to enrich the teaching of Agriculture and Primary Industries in regional schools and VET settings.

VOCATIONAL EDUCATION AND TRAINING IN AGRICULTURE

The Review recognises the key role played by VET in supporting the skills base in industry. VET in agriculture and related areas is delivered through four avenues:

- Primary Industries Curriculum Framework in senior secondary school
- TAFE NSW
- NSW Department of Primary Industries agricultural colleges
- Private RTOs.

Currently, most students undertaking VET through the Primary Industries Curriculum Framework are enrolled in Certificate II in Agriculture. The Review recommends that, over time, schools should move towards offering Certificate III in Primary Industries to promote employment outcomes for students.

The Review notes the success of BackTrack in delivering agricultural and other training and development to disengaged young people, through flexible delivery and partnerships with RTOs.

TAFE NSW delivers a wide range of agricultural education and training across the state, including through its network of Rural Studies Centres. However, the Review found that there is a lack of training opportunities in metropolitan areas, particularly for obtaining practical skills in agriculture. The Review also found the need for improvements in training provision for the aquaculture sector.

The Review notes that the NSW Government's *Smart and Skilled* will introduce contestable VET funding, which may create new opportunities for private RTOs.

Some specialised training may be financially unviable because there are small numbers of students spread across the state. For this reason, the Review recommends that agricultural and seafood courses be considered for thin market

Community Service Obligation payments to guarantee training in rural and remote areas.

The Review examines the operations of Tocal College and the Murrumbidgee College of Agriculture under the NSW Department of Primary Industries, and makes recommendations for the continued successful operation of Tocal College and the re-establishment of the Murrumbidgee College of Agriculture.

GOVERNMENT RECOMMENDATION 17

Where opportunities exist, schools move over time to offer Certificate III in Primary Industries for those students seeking employment in agriculture.

GOVERNMENT RECOMMENDATION 18

State and federal funding authorities recognise the benefits, for disengaged Aboriginal youth, of BackTrack and similar schemes in New South Wales and create flexibility of funding to ensure the schemes are able to operate with maximum benefit to participants.

GOVERNMENT RECOMMENDATION 19

TAFE NSW reviews the offerings in primary industries in the metropolitan area to ensure students have appropriate access to such training.

GOVERNMENT RECOMMENDATION 20

TAFE NSW works with the AgriFood NSW Industry Training Advisory Body to encourage:

- Establishment of aquaculture training packages and opportunities in oyster farming
- Review of training packages in fish farming to ensure business principles and environmental management are appropriately represented.

GOVERNMENT RECOMMENDATION 21

In Smart and Skilled, agricultural and seafood courses be considered for thin market Community Service Obligation payments to guarantee training in rural and remote areas.

GOVERNMENT RECOMMENDATION 22

The NSW Department of Primary Industries, in conjunction with the C B Alexander Foundation and other stakeholders, establishes a set of guidelines on what constitutes a 'Centre of Excellence in Agricultural Education and Training' and ensures the guidelines are implemented.

GOVERNMENT RECOMMENDATION 23

The Tocal College farms be managed as a business unit under the auspices of the C B Alexander Foundation.

GOVERNMENT RECOMMENDATION 24

The NSW Department of Primary Industries re-establishes the Murrumbidgee College of Agriculture under the following principles to provide the opportunity to build on the reputation of the past, yet with the flexibility to provide an expanded range of services. These principles are:

- a. That Murrumbidgee College of Agriculture has a defined location and that the boundaries of the entity are drawn up along the lines indicated in the report to enable the College to operate independently of Yanco Agricultural Institute
- b. That the facilities are operated under a not-for-profit trust and continued investment in the operation of the facilities be undertaken

- c. That an education and training subcommittee of the trust be appointed, comprising the NSW Department of Primary Industries, TAFE NSW, Yanco Agricultural High School and Charles Sturt University to advise on programs, farms, training facilities and inter-educational relations
- d. That training and other programs deliver to the needs of southern New South Wales and operate independently of Tocal College, but that the Colleges collaborate on issues such as a single NSW Department of Primary Industries Colleges RTO (which should not align in name with either college), publications, training package development, and other Departmental training initiatives
- e. That a College Director be appointed with skills in training, finance and enterprise management. Such appointment should be funded by the NSW Department of Primary Industries, have the independent authority to run the business and operate as the Executive Officer to the trust board
- f. That the trust invites regional industries to commit to the College through investment, support for training of their staff and involvement in the trust.

INDUSTRY RECOMMENDATION 8

Leeton and Griffith Councils, together with other local government organisations and key industries, give consideration to the establishment of an employment company similar to that operated by Narrabri Council.

HIGHER EDUCATION IN AGRICULTURE

The report notes the critical need to increase the number of graduates in agriculture and related fields.

The following universities offer relevant higher education courses:

- Charles Sturt University
- Southern Cross University
- University of New England
- University of Sydney
- University of Western Sydney.

Over the past two decades there has been a marked decline in the numbers of graduates. Downturn in demand for agriculture courses has particularly impacted upon the University of Western Sydney (formerly Hawkesbury Agricultural College), which suspended intake in 2012 because of low demand. There is also generally weak demand for and limited offerings of courses in horticulture, forestry and aquaculture despite reasonable employment prospects.

The Review notes industry concerns about the practical skills of graduates in agriculture, and identifies the following options to address the issue:

- Providing skills training to students prior to university through the Primary Industries Curriculum Framework
- Arrangements with TAFE NSW or agricultural colleges for students to undertake VET qualifications concurrently with degree studies.

Some individuals may pursue VET qualifications after they graduate from university in order to improve their practical skills.

Research and development are critical to improving productivity and promoting sustainable practices in agriculture, and postgraduate scholars make an important contribution to such research. However, the Review found that stipends for postgraduate scholars are not competitive with graduate salaries, and employment of researchers is not stable. The Review makes a series of recommendations to ensure that the best minds can be attracted to agricultural research and industry leadership.

GOVERNMENT RECOMMENDATION 25

The NSW Government, through the Standing Council on Primary Industries, raises the following matters with the Federal Government:

- a. Greater provision of top-up scholarships by Research and Development Corporations, to the maximum allowable under the taxation rules
- b. An increase in the maximum allowance for top-ups under the tax-free provisions for research scholarships
- c. The need to restore competitive and respectable stipends for postgraduate scholars under the Australian Postgraduate Award and Australian Research Council schemes including annual increments and superannuation entitlements.

GOVERNMENT RECOMMENDATION 26

The NSW Department of Primary Industries, in conjunction with key industries and universities, explores the merit of developing a professional development program focused on leadership, management and policy development in the agricultural sector through an alliance modelled on the Australian and New Zealand School of Government approach.

INDUSTRY RECOMMENDATION 9

The horticulture sector reviews its needs for courses in universities to ensure continued availability of higher education in horticulture.

INDUSTRY RECOMMENDATION 10

The forest industry comes together to review its needs for courses in universities to ensure continued availability of higher education in forestry.

INDUSTRY RECOMMENDATION 11

The University of Wollongong gives consideration to the inclusion of a major study of aquaculture production and management in its Marine Biology degree.

INDUSTRY RECOMMENDATION 12

Rural Research and Development Corporations and other research funders commit to a minimum of 5 years of funding for post-doctoral scholars with an obligatory 3 year review to establish prospects.

INDUSTRY RECOMMENDATION 13

The Australian Council of Deans of Agriculture explores the options for creating an alumni association of agricultural professionals across the university sector.

THE BUSINESS OF AGRICULTURE

The Review recommends a range of actions to challenge current perceptions of agriculture and promote a strong future for the industry through:

- Strong engagement with the education system
- Development of a workforce strategy and strong career promotion
- Development of an industry accreditation strategy
- Strong community citizenship and
- Using the media to promulgate positive messages to the community.

GOVERNMENT RECOMMENDATION 27

The NSW Department of Primary Industries undertakes to complete the renewal of the Memorandum of Understanding on collaboration between the Department, the Royal Agricultural Society of NSW and NSW Farmers Association with the purpose of increasing the range of activities year round to support the education needs in agriculture. Opportunity should be taken to engage commercial, industry and other government parties.

INDUSTRY RECOMMENDATION 14

The Royal Agricultural Society establishes a close working relationship with Primary Industries Education Foundation to facilitate quality industry educational resources being made available within the educational resource base of the NSW Department of Education and Communities Teaching and Learning Exchange, Scootle and the Board of Studies NSW Program Builder.

INDUSTRY RECOMMENDATION 15

The agriculture sector commits to the implementation of Operation 1-AG, as described in the report.

CONCLUSION

Agriculture makes a significant contribution to the Australian economy, and our strong performance and international reputation should be a source of pride. The key purpose of the Review has been to recommend measures to ensure that young people in particular are encouraged to pursue careers in agriculture, and have the skills and knowledge to support the continued success and growth of the industry.

The Brand

*Our agriculture is world class
At home it's taken for granted,
We have so much to celebrate
But we constantly complain
Our esteem, it should be very high
Yet clods get kicked around,
We could achieve so much together,
Yet our own thing seems much better.*

*The tapestry of bush culture
Is very rich and rare,
With the home among the gum trees,
And the swaggie by the billabong,
The dog's upon the tuckerbox
While Blue plays the didgeridoo,
The shears go click, click, click,
And emu runs the pants off kangaroo.
Let us rejoice.*

*Of course we can work harder, much harder
But let's work smarter, much smarter,
We need to move forward but is it too late?
It's never too late but we need to start now.
We need to build Vision, but what is the Vision?
Common purpose is a good place to start.
We need to build Brand, but what is the Brand?
Agriculture Australia, Agriculture Australia.
Let's advance Australia's fare.*

Jim Pratley 2013