The development and delivery of a new Diploma of Agronomy course

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Abstract

In response to industry identifying a need for higher level technical skills in crop and pasture agronomy, the Victorian Grains Industry Training Network conducted a scoping study to identify and prioritise the most critical aspects required. A steering committee representing a range of industry sectors was subsequently formed to oversee the development of a new qualification. The course was compiled using national units of competency from the RTE03 Rural Production Training Package or Victorian endorsed competencies from the 21704VIC Diploma of Sustainable Agriculture. Three new units of competency concerning crop and pasture nutrition, spray application technology and plant biology were also written. The 21972VIC Diploma of Agronomy was accredited by the Victorian Registrations and Qualifications Authority in 2009. Longerenong College was the first organisation to register the course, attracting 22 full or part-time participants in 2009 and 14 were eligible to graduate by early 2010. A survey indicated that these participants were highly satisfied that the course had met their requirements (mean rank = 8/10). Prior to undertaking the course, eight participants were working full or part-time on family farms or in agribusiness. Within three months of completion all had obtained full-time employment. Of those already working, about half felt that the course enabled them to perform their job better, whilst the other half obtained a promotion with the same or alternative employers.

Key Words

Vocational education and training, articulation, employment

Introduction

Concerns over the limited availability of labour and suitably qualified personnel in agriculture have been raised regularly by the industry over recent years (Pratley and May 2010). These authors conservatively estimate the agricultural job market in Australia to be around 15,000 per annum, with about 9,000 'on-farm' and 6,000 agribusiness positions. Graduates from Australian universities are fewer than 800 per year in agriculture and related degrees (Pratley and Copeland 2008). Course completions from the RTE03 and RUA98 Rural Production Training Packages have steadily increased from 3,300 in 2005 to 4,100 in 2008 (NCVER 2009), therefore the contribution of the Vocational Education and Training (VET) sector is important. In total, some 4,000 to 5,000 people complete an agricultural or related qualification each year, which is less than 33% of the apparent job market. Farming is becoming increasingly complex with the adoption of new technologies, financial pressures and increasing concerns over climate change, water use, the environment, food quality and security. Hence it could be expected that the industry will encourage or demand a greater proportion of agricultural personnel to hold some form of qualification in the future.

Whilst university degrees are required for some positions, the VET sector provides an alternative means of study in agriculture. Graduates from VET courses are employed in a range of vocations from farm labourers to managers, as technicians and in a range of agribusiness roles including agronomy. Some courses are general, whilst others specialise in certain industries such as dairy or sugar production. Anecdotal evidence indicated that there was need for higher level technical skills in crop and pasture agronomy. This was confirmed by a scoping study in 2007, leading to the development of a Diploma of Agronomy. The first part of this paper provides an overview of the scoping study, the process of developing the new qualification and its content. Longerenong College enrolled 22 full or part time students into the course in 2009 and 14 of these were eligible to graduate by early 2010. The second part

of this paper discusses student opinions on the new course, as well as reporting on employment outcomes.

Part 1: The development of the new Diploma of Agronomy course

Overview of scoping study

In response to industry identifying a need for higher level technical skills in agronomy, the Victorian Grains Industry Training Network surveyed producers, agronomists, consultants, farming systems group researchers, Recognised Training Organisations (RTOs) and the Department of Primary Industries (Berrisford 2007). The survey asked participants to rate the importance of skills and knowledge in a range of topics on a scale of 1 (not important at all) to 5 (critical).

Broadly, the topic of climate was rated important to critical, particularly understanding climate change, the impact of climate on production and interpreting weather conditions for spray application. Farming systems, soils and nutrition also rated in the important to critical range, particularly understanding rotations, the impact of cultivation, water use efficiency, interpreting soil tests and determining fertiliser requirements. Managing pests, weeds and diseases rated very highly with an emphasis on identification, growth stages, avoiding resistance, integrated pest management, chemical application and safety. Precision agriculture, including controlled traffic and variable rate technology generally rated in the important to very important range, although half of the respondents rated analysing the cost/benefit of this technology as critical. Managing grain and fodder storage was deemed important to very important. Plant breeding received the overall lowest ratings, but familiarity with crop and pasture varieties was still regarded as important to critical by most respondents. Occupational Health and Safety and legislation received very high responses as well. All surveyed practicing agronomists regarded legislation as critical, especially in relation to providing advice. Economics generally rated in the very important to critical range, although greater emphasis was placed on understanding budgets than marketing. All forms of communication also scored highly and one respondent stressed the need for agronomists to have good public speaking skills.

Overall very few elements received a rating below 3 (important) and the survey did not indicate any topic areas that could be excluded from consideration in agronomy training. The scoping study (Berrisford 2007) also acknowledged that existing national or Victorian units of competency would cover some skills and knowledge required by industry, but for other topic areas there were no relevant competencies available. Berrisford (2007) also investigated other training being developed by a range of organisations at the time.

Process of developing the new course in agronomy and accreditation

To oversee the development of the new qualification a steering committee was subsequently established with the aim of having significant industry involvement to produce the graduates required by industry. The committee included farmers, agronomists and representatives from the Department of Primary Industries, Primary Skills Victoria and RTOs. Longerenong College was appointed as the Project Writer. Initial discussions around the potential student cohort identified those studying other VET courses such as an Advanced Diploma of Agriculture and wanting to focus on agronomy, as well as university graduates that were seeking additional hands-on training. Discussions were also held to decide on the appropriate Australian Qualification Framework (AQF) level for the course. It was noted that the public sector often prefers university graduates, but that the private sector was more concerned with hands-on skills and the application of knowledge to different situations. It was decided the course should be at AQF level 5 (Diploma), rather than AQF level 7 (Vocational Graduate Diploma). The rationale for this included the desirability of applied knowledge in industry, the potential for university graduates to receive credits into a Diploma and the opportunity for those who undertake a Diploma to articulate into higher qualifications in the future. However, it should be noted that industry has recommended that inexperienced people seeking employment as an agronomist may be advantaged by completing both a Diploma of Agronomy and an Advanced Diploma of Agriculture.

The Diploma was compiled using existing national units of competency from the RTE03 Rural Production Training Package and Victorian endorsed competencies from the 21704VIC Diploma of Sustainable Agriculture to meet industry needs identified in the scoping study. Three new units of competency (Manage application technology, Design and manage a crop and pasture nutrition program and Apply plant biology to agronomic practices) were also written. After debate, changes and review, the new 21972VIC Diploma of Agronomy was formally accredited by the Victorian Registrations and Qualifications Authority in 2009. Any RTO in Victoria with suitable resources may apply to have the new qualification added to their scope of registration.

Prerequisites, delivery, duration, recognition of prior learning and pathways for further study

RTOs can interview prospective candidates to assess suitability, but other than reasonable literacy and numeracy skills the Diploma of Agronomy has no formal prerequisites. Delivery options are likely to vary among RTOs but might include full or part-time study, on and off the job training, block training and study by correspondence. The course duration will vary among RTOs, mode of study and the number of units undertaken concurrently, but full-time students could expect to complete the course in one year. Recognition of Prior Learning may also apply where candidates can demonstrate competency in any units to AQF standards. This might include completing assessment tasks or providing a portfolio of evidence. Previous study may lead to credits in the Diploma of Agronomy and similarly, completion of this course may lead to credits in other courses.

Content of the Diploma of Agronomy

The new qualification requires completion of a minimum of five core and five elective units (Table 1). Two electives may also be selected from other nationally endorsed Training Packages at AQF levels between Certificate IV and Advanced Diploma, provided they are relevant to the course outcomes or meet an enterprise need. Further details on the content of each unit can be obtained from www.ntis.gov.au.

Table 1. Unit of competency list for the Diploma of Agronomy (21972VIC).

Unit code	Unit name	Nominal hours
Core units		
RTE5002A[1]	Manage integrated crop and pasture production	120
or		
RTE5016A[1]	Develop production plans for crops	140
RTE5006A	Plan and manage long-term weed, pest and/or disease control in crops	130
RTE5916A	Prepare and monitor budgets and financial reports	140
VPB148	Manage soils to enhance sustainability	100

VPAU464	Design and manage a crop and pasture nutrition program	100
Elective units		
RTC5914A	Prepare reports	60
RTE5007A	Plan and manage a stored grain program	100
RTE5523A	Develop climatic risk management strategies	120
RTE5525A	Manage trial and/or research material	140
RTE5604A	Develop an irrigation and drainage management plan	120
VPB153	Select and implement a Geographic Information System (GIS) for sustainable agricultural systems	60
VPAU465	Manage application technology	100
VPAU807	Apply plant biology to agronomic practices	90
Total hours		1000 - 1190

[1]Either RTE5002A or RTE5016A must be selected as a core unit.

Part 2: Delivery and feedback on the new Diploma of Agronomy

Longerenong College was the first RTO to deliver the Diploma of Agronomy, enrolling 22 full or part time students into the course in 2009. The cohort was comprised of full-time students concurrently studying an Advanced Diploma of Agriculture, people working in industry and former apprentices. Delivery included a combination of traditional semester long classes, block training and study by correspondence to meet the perceived needs of the student cohort. By early 2010, 14 students were eligible to graduate from the Diploma of Agronomy. This group was surveyed using preferred guidelines (Pannel and Pannel 1999) to receive feedback on the new course and to ensure that industry demands were being met. Eleven surveys were returned with seven participants only completing the Diploma of Agronomy and five completing an Advanced Diploma of Agriculture concurrently.

Reasons students enrolled in the course

Reasons provided for enrolling into the new course included to “update experience, learn about new technologies, obtain a qualification to get a work as an agronomist, to gain a greater understanding of crop agronomy, plant growth and nutrition, personal development, it was a requirement for a job offer and because I come from a cropping farm.” Most students that were already studying the Advanced Diploma of Agriculture saw the new Diploma as opportunistic and complementary to their current studies.

Student opinions of course content

Feedback from the first group of participants to complete the new Diploma was positive with respondents rating overall satisfaction on a scale of 1 (unsatisfied) to 10 (highly satisfied) at 8/10 (range = 6 to 10). They were generally pleased with their choice of course and confident about career prospects ranking the course as improving their employment opportunities at 8/10 (range = 5 to 10). One respondent thought that the Precision Agriculture unit VPB153 could be excluded from the course, but all other participants felt that all units were relevant and warranted inclusion in the course. Suggestions for improvement included more extensive training in soil biology, managing problem soils and use of fertilisers. One respondent suggested that irrigation and pastures should be covered in more depth, especially carrying capacity and fodder production. A significant proportion of participants indicated that more emphasis could be placed on chemical use, including plant reactions, products and developing recommendations. The inclusion of endorsements such as Agvet Chemical Users Course (ACUC) and AGSafe training was also mentioned.

Employment or promotion since completing the course

Prior to undertaking the course, eight of the eleven participants who returned surveys were already working full or part-time in industry. Three months after completion all participants were working full time, one as a business manager, one in rural merchandise, four on farms and five as industry agronomists. On completing the course, one respondent indicated that the course had made no difference to their career so far, four felt that they were able to do their job better and the balance obtained a promotion with the same company or were able to progress their careers by securing alternative employment.

Discussion

From concept to accreditation the Diploma of Agronomy took approximately two years to develop. The first cohort of 14 students to complete the course are all working on farms or in industry and many were able to obtain a promotion. Positive feedback included “very happy with the course, it has given me a start in a job I’ve wanted to do since high school” and “really happy with everything I am doing, the course has helped me achieve this”. Overall the cohort was satisfied with the course and employment outcomes suggest that graduates have the skills to perform well in industry. Most suggestions for improvement from the first cohort to complete the course could be incorporated into existing units of competency by adjusting lesson content, although consideration must be given to the level of the course, i.e. Diploma (AQF level 5). An alternative for those wanting in more technical knowledge in certain topics is to articulate into higher level courses. The area of pesticides including products and formulating recommendations is an area for consideration. Industry endorsements such as the ACUC generally contain units of competency below AQF level 5 and so cannot directly contribute to a Diploma. However, industry needs for employees to have these endorsements could be met by delivery as short courses in conjunction with the Diploma of Agronomy.

An unexpected student cohort came from people working in industry with no formal qualifications in agronomy and this should be promoted as a means of providing qualifications in the agricultural workforce. People with significant industry experience may be eligible to receive Recognition of Prior Learning. So far the new course has not attracted any university graduates wanting additional hands-on skills. Declining student numbers in agricultural degrees is a concern and the new Diploma of Agronomy provides an alternative avenue for study. As a VET course, it may be less daunting than a degree due to the shorter duration, lower costs and lower entry requirements. An option for prospective degree students is therefore to complete the Diploma of Agronomy and then articulate to a university where they would receive credits towards a degree. Similarly, universities could recommend that some students undertake

VET training as a means of evaluating their suitability for degree studies or to satisfy entry requirements. In any case the agricultural industry could benefit from greater collaboration between the VET and university sectors to promote careers in agronomy and related fields.

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