

Faculty of Agriculture, Food and Natural Resources

Self Evaluation Report, May 2003

Preamble

This Self Evaluation Report is an interim report that will be updated after the Faculty has had time to evaluate the new non-departmental organisational structure, which has only just been implemented. Moreover, following the implementation of the restructure, Faculty will hold a retreat in June to further develop its strategic and operational plans, and to provide additional input into this report.

Introduction and Faculty Context

The Faculty has as its Vision:

To foster performance in teaching, research and community and professional service in the food, fibre and natural resource industries, and make the Faculty the place of choice for engaging in scholarship and research in agriculture and natural resources

and Mission:

To deliver timely, creative new concepts, ideas and technologies in science and economics pertaining to agriculture, food systems, natural resources and the environment, and in this way further enhance the performance of the rural sector, while meeting the needs and well-being of society. This mission will be achieved by

- *actively seeking to make the Faculty the key centre for agriculture, food and natural resource education in Australia*
- *teaching undergraduate and postgraduate students and encouraging them to enter into life long learning*
- *the acquisition of new knowledge through active research*
- *providing expertise to industry, government, professional organisations and the community at large.*

The term “agriculture” is used by the Faculty in a broad sense to include: crop and animal production; natural resource management; produce handling, processing and quality; food systems; marketing; and agribusiness. The importance of the interface between science and economics in teaching and research in agriculture, natural resource management and the development of sustainable food production systems is clear. The Faculty of Agriculture, Food and Natural Resources (AgFNR) provides the environment to foster such interdisciplinary collaborations, with its combination of expertise in applied sciences and economics giving the Faculty its unique character.

Strengths

The Faculty considers its main strengths to include:

- having core academic activities aligned to areas of strategic national and international importance
- location a in large population base for student and staff recruitment

- being part of a comprehensive research intensive University, providing strong links to cognate faculties and easy access to high level expertise and infrastructure in other sections of the University
- strong research culture, capacity and academic structure for postgraduate research training, and access to diverse sources of external funding for research
- research underpinned by strong basic science and economics
- a balance of general and niche degrees, all of which are four year programs that emphasise the application of basic science and economics
- the degree programs in Agricultural Economics and Resource Economics, which are not offered elsewhere in Australia.

Challenges

Increasing public recognition of natural resource issues, a future demand for research training in natural resource management, and increasing commercial interest in some research programs are seen as opportunities for the Faculty. However, the Faculty's ability to fully capture opportunities in research and teaching is hampered by its poor accommodation, particularly on the Camperdown Campus where activities are dispersed among several sub-standard buildings. The Faculty's main challenges include:

- improving its accommodation, especially on the Camperdown Campus
- improving teaching performance
- developing integrated teaching with other faculties
- further enhancing research, especially in areas where research effort is uneven
- maintaining balance in student recruitment and teaching capacity to meet demands of diverse target sectors
- succession planning as a significant proportion of the staff approach retirement
- provision of services as a small faculty.

The Faculty offers a diverse range of undergraduate degree programs, which lead to applied degrees in science or economics. All of the programs aim to give students an appreciation of both the technical and socio-economic framework of agriculture and natural resources management, while affording students opportunities to specialise in particular disciplines. The courses employ a wide range of styles of teaching and learning, but all place a strong emphasis on analytical, quantitative, computing and professional skills and experience. They recognize the diverse destinations of graduates, and that graduates need good interpersonal skills to be equipped for the workplace. The Faculty's undergraduate teaching has strong links to the research programs, which together with links to industry, ensure that course offerings remain up-to-date and relevant to the needs of graduates and employers.

A report on the Faculty's activities in 2002 was prepared by the Dean, and is included in Appendix 1.

As of the census date in 2003, the Faculty's total student load was 455.4 (392.5 HECS, 15.5 Local Fee, 45.2 International and 2.3 Other). The Faculty's student profile in 2001 - 2003 is summarized in the tables included in Appendix 2. Of the total of 834 students enrolled in the Faculty in 2003, approximately 41% were in undergraduate economics degrees, 40% in undergraduate science degrees, 14% were postgraduate research students, and 5% were enrolled in coursework Masters or Postgraduate Diploma programs.

The current academic staffing profile covers teaching expertise in plant production and food systems, sustaining the environment, and agricultural and resource economics, including:

- agronomy, crop physiology and nutrition, farming systems, irrigation, precision agriculture, decision support; plant disease, entomology, weeds, plant protection; production horticulture, postharvest, amenity horticulture
- agricultural biotechnology, more specifically cellular and molecular genetics, plant improvement, quality attributes and processing, food chemistry and biochemistry
- soil - soil chemistry, soil physics, pedology
- water (hydrology, water quality)
- ecosystems (nutrient cycles, soil fertility)
- agricultural production and price theory
- agricultural and natural resource policy
- agricultural marketing and international trade policy
- natural resource and environmental economics
- quantitative economic methods and modeling techniques
- agribusiness management.

The Faculty draws on teaching expertise in the Faculties of Science, Economics and Business, Veterinary Science, and Rural Management, and is seeking to further develop integrated teaching with these faculties.

Section 1 Quality Teaching and Learning

1a. Follow up to Phase 1 Review

The Faculty's Teaching and Learning programs were reviewed by the Academic Board in May 2002. The Review Team concluded that the Faculty was following good practices in the areas of equipping students with generic skills, attracting local and international postgraduate students and research led teaching. Students consider staff approachable, and good initiatives were identified in teaching and learning. The Review Team recommended that the Faculty give consideration to improving practices in the areas of rewarding good teachers, communication, input into the curricula of service units, staff-student liaison committee, induction and orientation of new staff, resources for research students, student feedback, and alerting students to their IP rights and responsibilities. The Faculty's responses to the recommendations of the Review Team are outlined in the following table.

Implementation of recommendations of the Academic Board Review of the Faculty's Teaching and Learning programs in 2002

Recommendation	Action
1. That although informal mechanisms are working well, due mainly to the small size of the Faculty, more effective formal mechanisms should be introduced. This would aid in the dissemination of information to all staff.	<p>To better disseminate information to students and staff, Faculty will by the end of 2003 significantly upgrade its website and printed material. The project is being undertaken with the assistance from a grant from the Teaching Improvement Fund for 2003. Separate password-protected intranet sites are being developed for students and staff.</p> <p>The goal is to have a separate webpage for each unit of study, that will include information on the</p>

	<p>expectations of students and assessment standards, how the teaching relates to generic skills, teaching material appropriate for electronic distribution, and if relevant, any related research being carried out in the Faculty. Information on policies and generic aspects of the undergraduate and postgraduate degree programs (eg, special consideration, the Professional Experience Program, field trips, generic skills, OH & S issues, IP, etc.) will also be upgraded and collated for electronic dissemination and preparation of booklets. Electronic academic bulletin boards will be developed for undergraduate and postgraduate students, and staff.</p>
2. That the Faculty consider ways of informing research higher degree students of their rights and responsibilities under the University Intellectual Property rule.	Faculty produced a Manual and held an Induction Day for postgraduate students in 2003 (Manual included in Appendix 3)
3. That the staff communicate the University generic skills to the students more clearly, and that these skills should be more carefully mapped to the curriculum in order to ensure consistent outcomes.	Staff have been advised to address this recommendation in their teaching
4. That further efforts are needed to improve the quality of teaching across the Faculty.	<p>The Faculty's intranet sites will provide standardised unit outlines, details of assessment, goals and expectations, appropriate content material.</p> <p>From 2003, Discipline Leaders and Unit Coordinators will implement processes to review teaching programs in the discipline groupings for quality and relevance of teaching and relevance of assessment to learning objectives as specified in unit outlines. This issue will be addressed at the Faculty's planning forum in June</p> <p>All new staff appointed to the Faculty will be encouraged to participate in programs from teaching development</p> <p>The Faculty's 2003 Budget has an allocation of funds for teaching improvements and initiatives, to be developed by Discipline Leaders and T & L Committee under new structure</p>
5. That the Faculty consider introducing a more consistent induction process for new and casual staff.	To be considered by AGMAC under new structure
6. That the Faculty consider the development of a Faculty level teaching excellence award.	Faculty has established a Teaching Excellence Award, which will be available from 2003
7. That the Faculty nominate lecturers from Soil Science 2 for a University excellence in	The key staff member will be on SSP in 2003/04

teaching award.	
8. That the Faculty investigate ways of providing more input into the curricula of teaching provided by other faculties.	To be considered by Faculty T & L Committee
9. That the Faculty considers ways of stressing the link between research and teaching to students.	Staff have been advised to address this recommendation in their teaching
10. That the introduction of a formal induction program for research students and opportunities for peer review and support be considered.	Induction Day for postgraduate students held in 2003, and Postgraduate Manual produced
11. That the Faculty consider ways in which the annual progress reports could be made more informative for students.	Will be implemented with 2003 cycle of Annual Reports
12. That the Faculty consider making improvements in the resources and accommodation for research students.	Student computing facilities greatly expanded by purchase of 30 new computers and conversion of Mac computer lab to PC
13. That staff consider providing feedback in class, as it would save time taken in individual feedback through their open door policy, and relieve pressure on staff.	Staff wish to maintain accessibility to students, which is considered to be a strength of Faculty's teaching
14. That the Faculty undertake more work in the articulation and communication of assessment standards to students.	Establishment of Faculty intranet site for each unit of study now makes this possible
15. That the Faculty instigate a process which acknowledges the problems raised and addresses the answers to them. The current process discourages students from coming forward with issues.	Faculty/Student Liaison Committee processes under review; input to be sought from next meeting

1b. Self evaluation against the Teaching and Learning Operational Plan, 2002

Objective 1: The Faculty will improve the teaching and learning experience of its students

Overall Target

Maintain and, where appropriate, improve the Faculty average in the Good Teaching, Clear Goals and Standards, Appropriate Assessment and Appropriate Workload scales so that they at least equal, if not exceed, the national Faculty average for each of the scales.

Strategies for 2002

- (i) Detailed analysis of the responses of course surveys, including –
 1. Identification of aspects of the student experience that require improvement.
 2. Identification of the means by which such improvement may be achieved
 3. Implementation of action to achieve the improvements
 4. Review of action taken through individual student feedback and SCEQ response scores
- (ii) Enhanced promotional activities, including –
 - Visits by undergraduate students to their schools of origin
 - Liaison with careers advisers and heads of school Science, Economics and Agriculture departments

- (iii) Evaluate and enhance initiatives for 2002, co-ordinated by the Faculty's Development Manager, including -
- Roll-up displays for the new degrees
 - Submission of articles by Faculty members to Science, Agriculture and Economics Teachers' Associations newsletters and to *The Land* newspaper
 - Poster displays for Science, Agriculture and Economics Teachers' Conferences

Indicators

- (i) SCEQ and GCCA CEQ scores for individual items, particular scales, and overall satisfaction
- (ii) Proportion of First year enrolments with a UAI above 90.
- (iii) Retention rates from first to second year

Targets for the period	Achievements
Improvement of the Faculty average in each scale so that it at least equals, if not exceeds, the national Faculty average for the scale by the end of 2003	Data not available
Increase median UAI by 5% during the period 2002 – 2006	In 2002 and 2003, the Faculty had a pleasing increase in recruitment of students, both in terms of quality and quantity, into all its undergraduate degrees. The median UAIs for the degrees were: BScAgr 80.5 and 84.5 in 2002 and 2003, respectively), BAnimSc 94.0 and 95.95, BHortSc 76.1 and 72, BLWSc 77.5 and 73.7, BAgEc 83.3 and 85.45, and BResEc 91.5 and 92.
Retention rates from first to second year improve by at least 5% during the period 2002 – 2006	For undergraduates (Science degrees) entering Year 2 in 2002, the retention rate was 80 %, compared to 67 % for those entering Year 2 in 2001. For undergraduates (Economics degrees) entering Year 2 in 2002, the retention rate was 73 %, compared to 72 % for those entering Year 2 in 2001.

Objective 2: The Faculty will maintain and enhance the quality of its programs

Target

Improvement of the degree average in the Generic Skills and Overall Satisfaction scales of the SCEQ so that they at least equal, if not exceed, the national Faculty average for each of the scales.

Strategies for 2002

- (i) Revise curricula for BScAgr and BHortSc for implementation in 2003
- (ii) Continue to provide standardised outlines, including details of assessment, goals and expectations for all units of study. Progressively make outlines available electronically
- (iii) Give careful attention to the relevance of assessment to learning objectives specified in unit outlines

- (iv) Provide better feedback on marking of assignments, where resources permit, by giving critical comments in addition to a grade
- (v) Review the level of progressive assessment in all units in the light of student concerns about excessive pressure
- (xi) Work in partnership with the information professionals at the University Library to create information and knowledge management systems, to benefit the Faculty, and the national and international community.
- (xii) Work in partnership with the University Library to digitise high demand course materials for access via the Library Catalogue and WebCT based units of study.
- (xiii) Continue discussions with the School of Biological Sciences about integration of teaching programs related to Plant Sciences and other areas of mutual interest.

Indicators for the above strategies

- (i) Response of employers and students to proposed curricula
- (ii) -(v) Student surveys
- (vi) Incorporation of the program in course outlines during their review; student assignments related to information retrieval
- (vii) New modules developed for WebCT
- (viii) Success in the development of suitable units of study in Plant Sciences.

Targets for the period	Achievements
Revised curricula for BScAgr and BHortSc degrees available	Postponed until Semester 2, 2003 due to Faculty re-structuring
Outlines of goals and expectations available for all units	A standardised unit outline has been developed for inclusion into all unit handbooks/manuals, and onto the updated Faculty webpage
Assessment procedures and items reviewed progressively throughout 2002	A Faculty policy document on <i>Examination and Assessment Procedures</i> released in late 2002
Incorporation of an information retrieval assignment into all units for which such an assignment is appropriate	Tutorials on information retrieval from staff of Badham Library are now given to all student groups in the Faculty
Development of teaching material for WebCT in at least 2 units	The unit AGEC3002 has had an extensive component of WebCT material, and a web-based lecture series has been developed for the AGRO3001 unit
Proposals for new integrated units with the School of Biological Sciences for approval in 2002, and for implementation in 2003	These proposed units are still being negotiated

Objective 3: The Faculty will improve the educational and physical environment for its students

Strategies

- (i) The Faculty will assist the transition of new first year students to the University environment by:
 - continuing its 'Bridging the Gap' program in O-week

- continuing its ‘Students at Risk’ program, monitoring performance in first year and counselling students who are experiencing difficulties
 - offering special first year tutorials (paid for by students), e.g., as already available in Chemistry
- (ii) The Faculty will provide extracurricular activities to complement the formal degree structures and foster broad interest in agriculture and the environment, including –
- The Undergraduate Achievers’ Program
 - Field Studies Program in Central Australia
 - Student Landcare Society
- (iii) The Faculty will continue to press for the construction of a new building to replace the Ross St building with new and up-to-date facilities and enable the Faculty to concentrate its teaching activities near the Watt and McMillan Buildings

Indicators

- (i) retention rates into second year from first year, and performance of students in first-year units
- (ii) student evaluations of the programs and membership of the Landcare Society
- (iii) completion of various stages of planning for the building

Targets	Achievements
Retention rates from first to second year improve by at least 5% during the period 2002 – 2006	For undergraduates (Science degrees) entering Year 2 in 2002, the retention rate was 80 %, compared to 67 % for those entering Year 2 in 2001. For undergraduates (Economics degrees) entering Year 2 in 2002, the retention rate was 73 %, compared to 72 % for those entering Year 2 in 2001.
Student evaluations reveal overall satisfaction with the programs	The 2002 SCEQ score for Overall Satisfaction (Q.36) was +31, which is in line with most other USyd faculties
Landcare Society develops into a vibrant student group	The Society had 75 student members in 2002; they conducted 5 fieldtrips during the year and utilised grant money obtained in 2001
Plans for a new building to be completed; university funding approved for its construction	Faculty is listed in the CDP for 2005/2006

1c. Review of Examinations and Assessments

The Faculty’s assessment and examinations procedures were reviewed by University’s Internal Audit and Review in late 2002. No major deficiencies were noted, although recommendations were made for improving some processes. Most of the recommendations have been or will be implemented. The Draft Audit Report and the Faculty’s responses to the recommendations are included in Appendix 4.

Section 2 Diversity Access and Equity

The Faculty is achieving this goal by providing

- scholarship schemes
- flexible admissions schemes for students from a diversity of backgrounds and for disadvantaged students; this scheme enables students with a UAI five points below the cut-off to apply for admission on the basis of meeting criteria of appropriate prior learning and career motives
- improved information for prospective students, parents and teachers
- programs for ensuring effective transition from school to university.

Over the years, diversity, access and equity have been raised in the Faculty by students and staff as issues of concern. The Faculty's student body comprises approximately 42% females, and about 40-50% of the students come from a rural background. The Faculty's student body contains a broad mix of ethnic backgrounds that enrich the academic programs.

Section 3 Excellence in Research

The Faculty has an excellent international reputation for its research, which attracts substantial external funding (\$M8-9 pa) and a strong cohort of postgraduate research students. Infrastructure to support research includes facilities for: plant growth in controlled environments; extensive farm and field sites; physical, chemical and biochemical analyses of plants, plant products, soil, and water; molecular biology and biotechnology; soil assessment and mapping; soil microbiology and soil-borne disease analysis; rural information systems and GIS; food chemistry; grain science; postharvest horticulture; microscopy and imaging.

The Faculty has several research centres – the Plant Breeding Institute with campuses at Cobbitty and Narrabri, the Australian Centre for Precision Agriculture, the Sydney University Nitrogen Fixation Centre, and the Centre for Salinity Assessment and Management (jointly with the Faculty of Science) - and has a major involvement in CRCs associated with the cotton, rice and wheat industries.

The research of the Faculty is in five main areas -

Sustainable crop production systems (biofertilisers; biological nitrogen fixation; biometry; cropping systems and crop modelling; irrigation science; insect systematics; molecular microbial ecology; pest management; plant nutrition and soil fertility; soil borne plant diseases; soil microbiology)

Sustaining the environment (GIS; hydrology; pedometrics; precision agriculture; rural environmental chemistry; salinity assessment and management; soil biodiversity; soil chemistry; soil contamination; soil science; water quality and management)

Plant Improvement (cereal breeding; cereal genomics and proteomics; fungal plant pathology; horticultural plant improvement; plant biotechnology; production systems for native flora)

Postharvest, processing and quality (grain science; food chemistry and biochemistry; postharvest horticulture; monitoring for mycotoxins and pesticides; quarantine policy and food safety)

Agricultural and resource economics (agribusiness and marketing; Asian trade and economic development; commodity modelling; agribusiness management; natural resource economics; operations research; policy analysis; risk modelling and management; technological change).

The main research strengths of the Faculty are in plant improvement, plant biotechnology, plant disease, cereal science, soil science, and precision agriculture, whereas research in post-harvest horticulture, salinity assessment and management, monitoring and remediation of land and water resources, land-use policy in developing countries, and resource economics are considered to be areas of emerging strength.

Benchmarking of research performance against Go6 universities

The Faculty is a significant contributor to the University's research effort, accounting for approximately 7.5% of research income and 5.5% of total research performance (Appendix 5). The Faculty's performance in research in 2000 and 2001 has been benchmarked against three Faculties deemed to be comparable in Go6 universities. According to the data in Appendix 5, AgFNR is ranked second and above average to well above average for total research higher degree completions, total publications, weighted publications, research income, and research income per FTE. The only category in which AgFNR ranks poorly is in Masters (Research) EFTSU, where the Faculty traditionally has low numbers. The Faculty normally has a ratio similar to that shown in the Table in Appendix 6 for PhD vs Masters (Research) enrolments. The Faculty experienced a significant decline in its postgraduate research student numbers in 2000/2001, which was in large part due to the transfer of the Department of Microbiology into the Faculty of Science. However, there was a pleasing 21% increase in PhD enrolments in 2003 over 2001 and 2002.

The diversity among the agriculture faculties in Go6 universities means that the benchmarking data need to be interpreted with caution. For example, two significant aspects in which USYD differs from other universities are (i) that AgFNR includes the discipline areas of agricultural and resource economics, which normally do not need nor attract large research income per FTE, and (ii) that animal science, a discipline area that provides strong opportunities to attract large research grants and postgraduate research student enrolments, is part of Veterinary Science in USYD.

An important indicator of research achievements is the continuing success of the Faculty in attracting external funding and postgraduate research students. As an example, the externally-funded Australian Cereal Rust Control Program (formerly the National Cereal Rust Control Program), has been based in the Plant Breeding Institute for almost 45 years.

Section 4 Internationalisation

The Faculty is achieving this goal through its strong international research links to current or recently-concluded international programs supported by the Australian Centre for International Agricultural Research, AusAid and IDP, in Vietnam, China, Indonesia, Cambodia, Papua New Guinea, Thailand and Fiji. Several senior academic staff are leaders of large ACIAR projects which give the University and Faculty strong international exposure. The fact that several major projects have been renewed, and indeed expanded is an indicator that successful outcomes have been delivered

In 2002, the Dean and Associate Dean International represented the Faculty at IDP and AusAid promotions in Phnomh Penh, Cambodia and Vientiane, Laos, and met with university academics in both countries. The Faculty signed an MOU in March 2003 with Faculty of Agriculture at Kasetsart University, Bangkok (the premier Thai university for agriculture) for collaborations in

research and teaching intensive short courses to postgraduate students in Thailand in a range of disciplines.

The Faculty has 65 international students, which account for 7.7% of enrolments. Undergraduate students are encouraged to take part in overseas student exchanges and undertake field work overseas; each year three to four students go overseas on exchange.

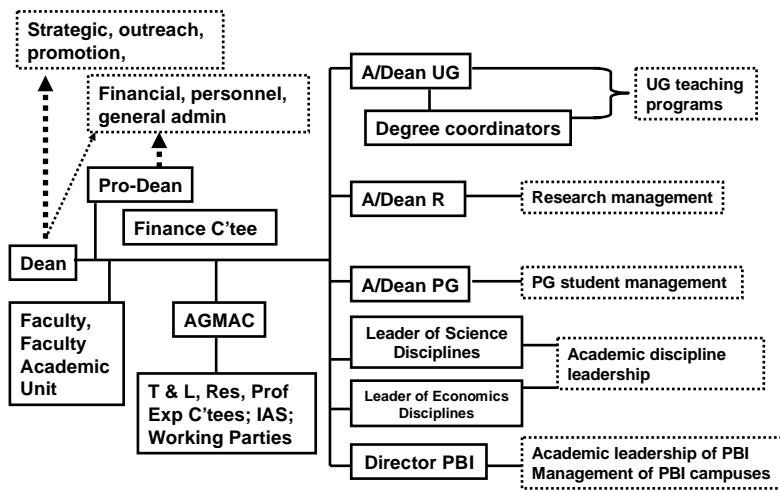
Section 5 Engagement with Industry and the Professions

The Faculty enjoys excellent collaborative relationships with CSIRO, NSW Agriculture, and important corporate stakeholders in agriculture, which present opportunities for inter-institution and inter-disciplinary research projects. The Faculty has a strong presence in teaching and research ventures pertaining to the rural sector and associated industries, and it works closely with rural R & D corporations, producers and organizations engaged in natural resource management, agricultural policy, agribusiness and quarantine. Student excursions to major production regions, and professional experience placements in a range of operations and locations, provide opportunities for students and staff to have good interactions with producers, industry advisors, extension officers, and natural resource managers. The Faculty is a major research provider to three CRCs associated with the cotton, rice and wheat industries, which fosters engagement and collaboration with these industries. The Faculty, through the Plant Breeding Institute, is the major research provider to two private ventures - NuFlora and SunPrime Seeds - in which the University is an equity partner.

Section 6 Effective Management

The year 2002 is likely to be regarded as a significant turning point in the Faculty's long history. After several years of in depth analysis and reflection on changes that have taken place in recent years within the University, in tertiary education in Australia, and in the agriculture and natural resources sectors, the Faculty determined that it would restructure into a non-departmental, single organizational unit. The Faculty also agreed on a Memorandum of Understanding for governance, policies and procedures in the restructured unit. From 2003, the Faculty will have two Discipline Groupings, one to manage the science degrees of the Faculty, and the other for the BAgEc and BResEc degrees. For administrative purposes, the Plant Breeding Institute will be considered as equivalent to a separate Discipline Group. The new structure, represented schematically in the diagram below, should provide an environment in which there will be minimal overlap and duplication in administration, and maximum opportunities for staff to meet their teaching and research responsibilities. A more detailed description of the Faculty's new organizational structure and roles and responsibilities is included in Appendix 7.

Organisational structure of the Faculty of Agriculture Food and Natural Resources



Section 7 Service to the Community

The Faculty is effectively addressing this goal through a range of initiatives, including

- the student Land Care society, which has received an external grant for revegetation
- annual visits to up to ten high schools, including presentation of lectures on HSC syllabus topics in areas of the Faculty's expertise
- annual Ag Camp weekend for about 70 Year 11 students
- hosting teachers and careers advisors; approximately 30 attended the Faculty's presentation in 2003
- participation in agricultural shows.

Section 8 Evaluative Summary of the Faculty's Effectiveness in Contributing to the University's Seven Goals

The Faculty considers its major strengths to be in research and research training, engagement with industry and professions, and internationalization, is contributing strongly to the University's Seven Goals in these areas.