in views on agricultural economics education among academics and employers and to observe that, if anything, the divergence was greater within each camp. It is appropriate that we should hold such a meeting in Australia's Bicentennial year. However, it is embarrassing that it has taken the Society about 30 years to get around to it. We hope that these meetings become a regular feature of future conferences.

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Teaching Agricultural Economics

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The issue of what kinds of knowledge and skills students should master by the time they graduate has not been addressed before by either the Australian Economics or Agricultural Economics professions so far as the author is aware. The issue has only rarely been raised in a serious way by the American economics profession. However, I believe that the American Agricultural Economics Association discusses these issues every three years or so at their Annual Meetings, but these sessions are not as a rule published in their Proceedings.

The comparative lack of attention to teaching issues by economists (American Agricultural Economics Association excepted) is peculiar in the light of significant professional interest in examining the outcomes of a wide variety of public projects through cost-benefit analysis and other economic frameworks. A goal commonly postulated by economists is that they try to teach students how economists think, but they have little evidence as to their success. Whatever success, or lack of it, teachers have had in teaching students how economists think, the economics profession is generally seen to have done a bad job in communicating basic economic principles to the public (Rees 1986).

We would expect communication of macroeconomic principles to the public to be poor since there are deep conflicts within the profession in this area. But in the area of microeconomics, where there is substantial agreement among economists on basic principles, it is nevertheless easy to pose questions to which most economists would answer yes while most non-economists would answer no. See, for example, the questions posed by

* La Trobe University. I am grateful to Geoff Edwards for some useful discussion.

McCloskey (1982, p. 3).

It may be argued that economists are stuck with an impossible task in trying to communicate with the general public. By its very nature, economics is a complex subject, but one which every adult citizen thinks they know something about and many of whom have deeply entrenched prejudices. Moreover, the waters are commonly muddied by interest groups that are ever-ready to lobby for economic decisions that they will argue are in the public interest, but in reality serve thoroughly private interests. The media all too often stokes fires portraying economists as a profession that rarely agrees about anything. Conflict is more newsworthy than consensus and media reports showing disagreement among economists seldom draw a distinction between positive economic analysis (*i.e.* what is) and normative economics (*i.e.* what should be).

In my view, the task of public communication in economics is a difficult, but not impossible one. Agricultural economists have a responsibility to improve the level of public understanding of micro and macro problems in agriculture and related sectors. This process begins with what and how we teach our students.

What should we expect graduates to know and be able to do?

This is a difficult question to answer. There is a great variety of jobs that graduates with training in agricultural economics do and there is an array of degrees in which agricultural economics is taught. At one end of the spectrum is the broadly based (physical-biological-socio-economic) B.Ag.Sc. degree with a predominantly prescribed program as taught, for example, at the Universities of Western Australia, La Trobe and Melbourne. Other Schools of Agriculture, for example, at Queensland University and Lincoln College, have a prescribed degree program in the early course years and then permit specialization.

The degree course in agricultural economics which commenced at Sydney University in 1987 requires students to complete Economics I, II and III and students are able to select from an array of other optional units offered by the Faculty of Economics. These features permit the agricultural economics component of the B.Ag.Ec. degree, much of which is common with that in the B.Ag.Sc. degree, to be taught by the traditionally small group of agricultural economists found within a School of Agriculture. A similar degree is being considered by La Trobe University since it appears that few students from Victoria go to New South Wales to undertake a Bachelor of Agricultural Economics degree. The longer established B.Ag.Ec. degree at the University of New England has a large group of agricultural economists and a correspondingly wider array of agricultural-resource economics and agricultural business management courses and specialist streams than can be offered by a School of Agriculture.

Some Faculties of Economics (*e.g.* Monash, ANU and Adelaide) offer agricultural economics courses that students may select as optional units for an economics degree. Finally, there are the Agribusiness courses given at the Chisholm and Curtin Institutes of Technology, with their emphasis on management, and the farm management and agricultural economics courses taught at the more vocationally orientated Colleges of Agriculture.

The wide variety of jobs that graduates with training in agricultural economics do in the private sector, and in public agencies at State, Commonwealth and international levels reflects, in part, the variety of course structures and institutions within which agricultural economics is taught. Some jobs are highly practical while others require a lot of conceptualization and theory. Some jobs make direct use of much of the course content a student has mastered for a degree or diploma, while others do not.

Is it possible to identify a set of proficiencies that all, or most students graduating with the above types of degrees and diplomas, should have? A central task for nearly all graduates is to be able to gain access to, and display command of,

existing knowledge. Most commonly, graduates will be required to write and/or evaluate reports of various forms. In this respect, I believe the following proposal by Hansen (1986) for Economics majors—which I have expanded and modified a little—is insightful.

Graduates should be able to:

1. Gain access to existing knowledge:

Locate published research in agricultural economics; locate information on particular topics and issues in agricultural economics; search out and understand economic data.

2. Display command of existing knowledge and good communication skills:

Explain key economic concepts—*e.g.* opportunity cost, factor substitution, comparative advantage—and describe how they can be used; state succinctly the dimensions of a current agricultural economics policy issue.

3. Display ability to draw out existing knowledge:

Show what economic concepts and principles are used in agricultural economics reports published in articles from newspapers, newsmagazines *etc*; write a precis of a published journal article; read and interpret a quantitative analysis including regression results.

4. Utilize existing knowledge to explore issues:

Prepare a written analysis (of say 6 pages) of a current agricultural economics problem; prepare a memorandum (of say, 2 pages) that recommends a course of action on an economic decision faced by the institution.

5. Create new knowledge:

Identify some agricultural economics problem or issue and formulate a question(s) that will facilitate investigation and analysis of the issue; prepare a proposal for a research project; complete a research study and write it up in a polished 20 page typed paper.

Do these proficiencies reflect what we think is important to impart to students? The criteria are fairly neutral with respect to course content except perhaps for students planning postgraduate training. That is to say, there may be some conflicts between designing a bachelors degree, and methods of teaching and evaluating students to attain the above skills, and designing a course that provides the best intellectual foundation for postgraduate programs, that emphasize techniques. Of course, tensions relating to program goals and methods of attaining them, exist within postgraduate programs. Colander and Klamer (1987), for instance, point out that in top-ranking American graduate economic programs tensions exist between the emphasis on technique and the desire to do policy-orientated work. Their survey results show that what students believe leads to success in graduate school is definitely techniques and mastering complicated theory. Students see little incentive to know the literature in an area, or to have institutional knowledge of a particular area, or to generally understand the economy. Furthermore, though most postgraduate students believed that reading in areas such as history and political science, and to a lesser extent, philosophy and sociology, was important for their development as economists, most did not undertake such reading because they lacked the time. It is worth noting here that the typical American economics-agricultural economics undergraduate programs have more of a liberal-arts orientation than does their Australian counterpart.

With respect to the set of proficiencies listed above, Hansen claims that the traditional means used to evaluate students undertaking economics majors, and standard style-essays, does not determine whether students have acquired the necessary skills. In order to do this the major would have to be restructured somewhat and the final few weeks of the last year in the degree devoted to a hands-on testing program designed to permit students to demonstrate their proficiencies both in writing and verbally. "The likely result is that students will be taught less, but will learn more, and learn what they do learn better than now" (Hansen 1986, p. 152). A similar view is expressed by McCloskey (1983) when he is critical of

economics teachers for relying too much on axiom and proof instead of problem-solving and practice:

> ... economics is not primarily a matter of memorizing formulas, but a matter of feeling the applicability of arguments, of seeing analogies between one application and a superficially different one, of knowing when to reason verbally and when mathematically, and of what implicit characterization of the world is most useful for correct economics. (McCloskey 1983, p. 153).

Clearly, the proficiencies approach is likely to involve more work for teachers and it raises the issue of teaching incentives and evaluation of teaching performance. This issue is beyond the scope of this paper.

Agricultural economics probably does a better job than economics with respect to the above proficiencies. It has the advantage of being explicitly applied and its graduates have established a reputation for addressing real world problems of significance in agriculture and related sectors (Harl 1983). The four year B.Ag.Sc. and B.Ag.Ec. degrees are also commonly characterized by a good deal of written work on topics and larger projects, especially in the fourth year, which help to develop the proficiencies outlined above. Indeed, the two-semester Research Seminar course at UNE, for instance, which aims to give fourth year students the opportunity to design and complete an independent research project, is considered to be the capstone of their B.Ag.Ec. program. There has been a trend in at least some economics degrees in recent years, however, to focus on application and avoid theory for the sake of theory. This is reflected, for example, in the style of a number of intermediate microeconomic texts which in the last decade or so have increasingly incorporated an array of real-world applications. It is also reflected in the final year of, for instance, the ANU economics degree, which attempts to "round-out" the degree with respective terms of international trade policy issues, applied microeconomics (in-depth case studies), and applied macroeconomics.

The above discussion raises the question of the linkages agricultural economics has and should maintain with the core (parent) discipline and other supporting areas. It can be argued that a four year B.Ag.Ec. degree does and should encompass most of the economic theory covered in a three year economics degree. Many employers seem to view a B.Ag.Ec. degree as being a degree in applied economics and employ agricultural economics graduates as applied economists often to work in areas unrelated to agriculture. As a degree in applied economics, the B.Ag.Ec. degree has the advantage over the B.Ec. degree of being a four year program. The future strength of Agricultural Economics requires that it maintains strong linkages with Economics and other supporting disciplines and it continues to address real world problems.

Course Content and Structure

The greatest strength of agricultural economics has traditionally been in microeconomic analysis where the discipline pioneered in the development of rigorous analysis at the level of the firm. The heart of most curricula in agricultural economics, both in Australia and overseas, are courses in production economics and principles of farm management, agricultural marketing and prices, and agricultural policy. In addition, most curricula include economic statistics and computing.

There are, though, considerable differences in the content and structure of courses and the prescribed reading material beginning with first year agricultural economics courses. Most degrees contain a broadly focussed introductory course on the principles of agricultural economics (Lincoln College is an exception). However, some like those at UNE and UWA have a substantial component of macroeconomics while others, *e.g.* Sydney and Melbourne Universities, have a complete microeconomic orientation.

Most B.Ag.Sc.-B.Ag.Ec. courses attempt to achieve an intermediate level of microeconomic theory—about equivalent to, say, Hirshliefer (1987). Areas such as decision-making under risk and uncertainty, multi-product firms, and futures markets are appropriately given more attention in agricultural economics.

Whilst there appears to be a reasonable consensus about the level of microeconomic theory that should be aimed for in undergraduate agricultural economics, this is not true of macroeconomic theory.

My own view is that macroeconomic theory in the B.Ag.Sc. course should be limited to those basic fundamentals about which there is a good deal of consensus. The opportunity cost is too high of including in the B.Ag.Sc. degree macroeconomic material about which there are divisions and conflicts in the economics profession. It is becoming increasingly difficult to do justice within the structure of the B.Ag.Sc. degree to the three areas of production economics and farm management, agricultural marketing and prices, and agricultural policy. Increasingly, a good agricultural policy course needs to cover international trade issues and resource and environmental issues. In the area of agricultural marketing, the rapidly evolving literature on industrial organisation and agribusiness is also relevant, but I think most agricultural economists have done little reading in these areas. The food and fibre value-adding industries beyond the farm gate are becoming more and more important. The President of the Australian Agricultural Economics Society in his 1988 presidential address says that more time should be given to teaching the nitty-gritty of the political process and mechanisms for attaining policy change in the real world.

Are undergraduate and graduate programs in agricultural economics adjusting rapidly enough to meet these demands and to maintain their reputation for imparting to students a high level of ability for problem-solving? Increasingly, hard choices will need to be made about what new material to introduce and what old material to cut. The choices are likely to be especially hard in the B.Ag.Sc. degree and we will need to be modest about the level of agricultural economics knowledge acquired by these students, particularly for B.Ag.Sc. courses that do not permit specialisations. A logical step for more Schools of Agriculture may be to follow Sydney University and introduce a B.Ag.Ec. degree while maintaining the traditional B.Ag.Sc. degree. Alternatively, there is the Queensland University model where, beginning in the third year, B.Ag.Sc. students have about ten specialist streams to select from, including streams in agricultural economics, agricultural extension and land resources management. The large Department of Agricultural Economics and Business Management at UNE provides, of course, the most comprehensive streaming program in Australia with major streams in agricultural economics, farm management, agricultural business management, and resource management economics.

Should a full economics major form the theoretical core of a degree in agricultural economics? What and how much agricultural science is desirable for a B.Ag.Ec. degree? It would seem that very little knowledge of agricultural science is required for agricultural economists specialising in many areas of agricultural policy, whilst knowledge of agricultural science is particularly helpful for agricultural economists specialising in particular areas of production economics and farm management and resource economics. The Faculty of Agricultural Science at the University of Queensland has an introductory course covering the bio-physical and socio-economic aspects of agricultural systems. UNE has a principles of Agriculture course for B.Ag.Ec. students. Sydney University has no such course, but students, as in most other schools of agriculture, are required to obtain about 3 months' practical experience in agriculture during the course of their degree.

An important question that underlies much of the preceding discussion is what is the market demand for different types of B.Ag.Sc.-B.Ag.Ec. students and should we be attempting to respond and tailor our undergraduate and graduate programs solely to meet perceived market demand?

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Experiences in Developing an Agricultural Business Curriculum

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Introduction

This paper discusses curriculum development issues in the context of the author's recent experience at Massey University. However, the exercise involved surveys of other teaching programs, employers and employees, and consultation with visiting experts. It is hoped that this paper will provide insights to teachers and administrators at other institutions.

Massey has a relatively long history of teaching agricultural business. The Business Faculty, which now dominates the University, grew out of the Department of Agricultural Economics and Farm Management in the early 1970s and the first business degrees were agriculturally related. In 1984, it was decided to initiate a review of agricultural business teaching. This exercise, which was completed in 1987, included surveys of employers and employees, an investigation of agribusiness teaching programs in the USA and visits by two American professors. A workshop on agribusiness teaching was held in November 1986 and, early in 1987, a development plan was submitted for agribusiness teaching in the University. In 1987, the Department of Agricultural Economics and Business lost three (out of five) staff by retirement, resignation or transfer. Two of these positions are presently (April 1988) being advertised as a Chair and Senior Lectureship in Agricultural Business.

Two definitions are required. Firstly, "agribusiness" includes farm production,

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