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## FORMAL TRAINING REQUIREMENTS FOR FUTURE MANAGERS OF COMMERCIAL AGRICULTURE

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The title of this article restricts our discussion to training for commercial farm management. As most are aware, however, the structure of the entire agricultural business complex has changed greatly in recent years. We have seen a sharp growth in the number and size of commercial farms with resource capabilities far beyond those of traditional family farms, the transition in some agricultural industries (as in broiler production and cattle feeding) to factory types of operation, and vertical integration of food and feed companies toward agriculture and even into farm production. We are also observing the development of agricultural corporations. Some of these are integrating into agribusiness operations and in conglomerate patterns. For example, some of our Texas cattle feeding corporations have now merged with chemical companies or oil firms, and one has acquired a large scale broiler enterprise. A number own and operate ranches or meat packing plants. One or two have established subsidiary credit corporations. This emphasizes the difficulty we have today in distinguishing between the managerial requirements of commercial agriculture and the managerial requirements of agribusiness. Today, many farm enterprise decisions are made by agribusiness management, often on the advice of an agribusiness economist. On the basis of these arguments, we can expand our thinking to include formal training requirements of agribusiness industries.

Without a doubt, the managerial requirements and entrepreneurial functions of commercial agriculture and of agribusiness firms are changing. The question is whether or not the training received in agricultural economics is appropriate? Among others, some agribusiness economists claim that it is not. A. C. Hoffman, Vice President, Kraft Foods Company, for example, has said that "... the agribusiness economist should be trained not only in economics but also for general business management. A corollary to this is that the type of training traditionally offered by

our colleges of agriculture and their agricultural economics departments is not, in and of itself, adequate to this purpose" [2, p. 449]. He claims that the "... typical undergraduate curriculum taken by most agricultural economists leaves a good deal to be desired." "Too much of the course work," he says, "is narrowly vocational, there is too much orientation toward the physical sciences, and correspondingly too little in the direction of such basic disciplines as the humanities, the social sciences, psychology, communication, mathematics ..." and similar subjects [2, p. 450]. At the same time, we are criticized for graduating students who know too little about agriculture and are charged both with too little and too much emphasis on economic theory and on statistical research methods and techniques. It seems that we are "between a rock and the hard place."

Hoffman's major point is that "Agribusiness economists will need something very different in the way of theoretical and empirical economics than most departments of agricultural economics have traditionally offered" [2, p. 448]. I do not entirely agree as I am convinced that there is and can be no substitute for good training in economics, econometrics, and statistics. At the same time, some changes apparently do need to be made (primarily in undergraduate curricula). The departments in several schools apparently have already initiated action. Most notably, these include Purdue, the University of California at Davis, the University of Minnesota, Oregon State University, and the University of Missouri. Many other institutions are planning changes.

In an article replying to Hoffman's comments, Charles French [1] made the following points:

"We may be better at method than at subject matter.... We can be criticized for how we do the job but our basic objectives and concepts are fundamen-

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tally correct. We advance, modernize, and raise our standards just as agricultural business does." He dismisses as "hogwash" the idea that we are preoccupied with classical economics, family farm organization, internal capital supply, farm management, and agricultural science.

French claims that we also have become sophisticated and produce to specifications. He says, "We are training better men than many agribusinesses are hiring ...(and that).... we may be giving better training than our products get a chance to use." He also believes that much can be accomplished if agribusiness economists and the academicians would work together and suggests seven specific possibilities for accomplishing this. Along with others, however, French admits that changes and improvements are needed. His comments apply more to graduate training, while Hoffman was concerned mainly with the undergraduate curricula.

No one has all of the answers. Like others, we have some ideas and, unlike many others, we have been doing some experimenting over the past 5 to 6 years.

#### **PRINCIPAL DEFICIENCIES IN TRAINING UNDERGRADUATES FOR MANAGEMENT**

Lester Kellogg of Deere and Company has said: "Agriculture in the future will demand and it will have management skills which cannot be provided or assured by inheritance. Agriculture will have management skills equal to those of any other industry in the United States [2, p. 453]. But what is managerial capability? It is the ability, according to objectives of the firm, to make effective and appropriate decisions as needed. It includes the capability of simultaneously considering a variety of activities and enterprises, of planning and of keeping all activities moving along smoothly and efficiently. Decisions concerning the allocation of all available resources, however, are fundamental. The question, then, is, How is decision-making ability developed and improved?

The Chicago Agricultural Economists Club arrived at a consensus on the following point: "What we need in the management function of problem solving and decisionmaking is well developed reasoning ability and an analytical mind. The emphasis should be on the development of the capacity for logical and incisive thinking" [2, p. 449]. But how is this accomplished? This is the question so many are asking.

On the basis of what I have read and our experience over a period of years, I have decided that there are at least three principal areas of deficiency in most undergraduate agricultural economics curricula.

The first of these is concerned with the type of product that comes to us. Today, modern commercial farm and agribusiness managers must often deal with and compete closely with urban business managers and others trained to a high level of social sophistication. In so doing, managers with rural backgrounds often are handicapped by poor communication skills. These and many potential farm managers have difficulty in communicating either verbally or in writing. This same problem has been quite evident to me in undergraduate training. The errors made in spelling, grammar, and sentence structure by agricultural majors after 4 years of university work and possibly some graduate work never cease to amaze me. The skill of these students with mathematics is also often deficient. This is an old problem, but the significance and implications have increased. Some of this deficiency is understandable. Many agricultural students are from small rural high schools where the football coach still teaches arithmetic and where scholarship in subjects such as English still is not greatly appreciated. An agriculture student often must lose a significant share of his vocabulary and acquire a new one when he goes to college. At the college, or university, it is assumed that basic reading and writing skills have been acquired. Themes and papers receive a grade, but the student is not required to write and rewrite these until they have reached an acceptable level of quality. Even though he nearly flunks the first course in English at the college, the second is a course in literature.

All undergraduates are products of the television age. Some refuse to read more than the absolute minimum and others are slow. Some studies have shown a positive correlation between academic attainment and the ability to read. Much more emphasis needs to be placed on basic reading and communication skills. While this emphasis may have increased, its importance has increased even more. Acceptability, in this respect, is not the same in the offices of industrialized business firms as on the family farm.

The second major deficiency is found in the general area of logic and philosophy. We are feeding students "canned" logic in theory courses and we are placing considerable emphasis on research methods and procedures, but in the process are we teaching students to think for themselves? We insist on rigorous thought, but we do so within a narrow framework.

The major implicit assumptions of many of our undergraduate programs is in error. We assume that after a student has been exposed to economic theory, production economics, statistics, and marketing, he will relate training in one course to that in another and combine training from all courses in focusing attention on a specific managerial problem. He will

not necessarily do so, because, for one reason, this was not provided for him in any specific course and he has not been trained to think outside the boundaries of specific training. I will never forget my surprise early in graduate training (it came that late) to find that there were strong connections between economics and marketing and that marketing contained a great deal of economics. Students view a curriculum as a collection of specific courses. Because the student is looking for solid and so-called "practical" content in every course and not considering each as a part of an organized program, he is often highly critical of certain courses, such as those concerned mainly with theory.

Courses in logic and philosophy do not necessarily overcome all of these problems. It is difficult to fit these courses into the program and, in addition, some have only remote applications to business decision-making. As they are taught today, some courses in sociology and philosophy lead to more confusion and less rigorous decisionmaking. All of this focuses our attention on a certain question: How do you train people to think both rigorously and independently, using the training they have received as an aid where needed? Once out of the classroom, many students immediately revert to a pattern of thought about specific problems exactly as they did before they entered college and frequently as their fathers thought before them.

The other major area of deficiency in training is absence or unbalanced use of logic or theory and statistical techniques in the solutions of specific problems. Within the confines of specific courses, we provide examples and applications. However, even after completing all of his training, the typical undergraduate seems to be lost when confronted with an actual problem. He has little or no knowledge of where to begin or how to proceed. If he thinks of economic theory at all, he doesn't know how to apply the principles. Although he may be vaguely aware that some specific technique may have some application, he does not know how these relate to the problem at hand. He has not been taught how to develop a conceptual framework, specific objectives, specific hypotheses and to select appropriate tests. Economic theory and statistics were never sufficiently integrated in any course for this purpose. Too often, instructors, in courses of statistics and research procedures, pose a problem and then jump across intervening questions, and steps to a mathematical model and particular procedures. These same problems often are evident to a surprising degree in new Ph.D.'s

#### **SUGGESTIONS TOWARD IMPROVEMENT**

Various approaches have been tried in attempts to remedy some of the deficiencies. Consequently, the

principal thrust has been to introduce more matrix algebra and emphasis on operational research techniques. New courses in "management" are organized and others are "beefed up" with more attention to linear programming, inventory models, interregional models, models of price discrimination, etc. These changes miss the major points of deficiency and, in some respects, simply compound the problem.

A number of changes made in the undergraduate program at Texas Tech, several years ago, seem to be meeting with some measure of success. While we certainly do not believe we have "the" answers, we seem to be moving in the right direction. Our intermediate micro theory course and a beginning 4-hour course in statistics were shifted down to the first semester junior level—these are taught in a rigorous manner. Special care is exercised in the statistics course (with three hours of lecture per week and one hour of laboratory work) to provide a solid basic understanding of elementary statistical methods. We lose a number of students in the process, but for others we provide a basis for rapid progress through the remainder of the undergraduate training. Students are not permitted to enroll in advanced marketing, production economics or other similar courses until they have successfully demonstrated capability in economic theory and have initiated work in statistics. This concentrates training in these basic disciplines and, at the same time, provides more time in later courses for emphasis on applications. In addition, courses in production economics and marketing are prerequisites for enrollment in advanced farm management and agribusiness management. Thus, courses in management are elevated to highest positions in the undergraduate program, along with certain others, such as econometrics.

Another change was made with the introduction of a two-hour course, at the junior level, concerned mainly with the philosophy of science as it applies in the social sciences and as related to certain elementary analytical methods and procedures. Here, the student is confronted (perhaps for the first time) with the question, "What is reliable knowledge and how can it be obtained?" Right here, the student is given to understand that a good farm or business manager is one who makes decisions effectively on the basis of knowledge which he hopes or assumes is reliable. At the same time, the student learns that it is extremely difficult to know anything, especially as it relates to the future. The principal historical approaches in the search for reliable knowledge are considered. These include the categorical syllogisms and highly developed systems of logic provided by the Greek philosophers but the "conclusions" of the philosophers are treated as hypotheses. The student learns that a conceptual framework is a useful tool in the search for knowledge. The empirical methods of

Bacon and his followers also are given attention. Here the student learns that the approach which develops huge stacks of information, some relevant and some irrelevant, is costly and may not provide the information needed. From this point, we proceed toward consideration of modern scientific methods and designs. The emphasis, however, is on the logic rather than on the specifics of experimental design or specifications of models. Up to this point, most of the students have not had a course in statistics.

In this course, we also teach the undergraduate how to design a project proposal. He is required to write several proposals, and we are meticulous about how the problem statement, objectives, and procedures are written. The course is also concerned with the content and organization of a research report. Considerable emphasis is placed on chapters concerned with conceptual framework and research procedures. The student is not permitted to think of conceptual framework as the mathematical theory supporting his mathematical model which is extremely important. We insist that "conceptual framework" is pure logic and represents application of appropriate economic principles to a specific problem. It logically leads to hypotheses to be tested in the study.

In this course, we make sure students understand simple analytical techniques. These include budgeting, breakeven analyses, graphic correlation and tabular analytical methods. The results of this are surprising. Too many agricultural economics majors graduate with a feeling that while they have had the required number of courses, there is nothing specifically they are trained to do. Confidence and enthusiasm for agricultural economics rises sharply when students are given an early understanding that they can arrive at new or more reliable knowledge and of how they can use certain tools and apply them to specific practical problems.

At the senior level, students in most all undergraduate options are required to enroll in a 3-hour problems course. A problems course can be any one of many things. It can be a supervised reading course; it can be a way of requiring a student to audit another course; it can be a term paper; or it can be little or nothing at all. Our senior level problems course is definitely what the title implies. Having been taught how to proceed, the student is required to complete a miniature thesis. An advisor is selected and a few review sessions are conducted, but, otherwise, the student is free to allocate his own time and proceed as he desires. One of the tests, in this course, is to see whether or not the student can effectively discipline himself and schedule his time without close supervision. The results affect faculty recommendations.

Because the objective is to teach a method, only a very small problem is selected. An example might be: "How much cotton acreage is required under specific conditions for breakeven costs on a cotton stripper?" or "implications of seasonal patterns in lamb prices for placement on feed and marketing." Emphasis is not placed on the findings but on approach, organization, and research procedure. The intent is to teach how such questions can be answered in a more rigorous and organized way.

We are meticulous about organization of the report, and in this respect there are some alternatives. In general, however, an introductory chapter along lines of the project description is required. This provides the student with a definite place to begin. Requirements with respect to a chapter on conceptual framework are rigid. It is here, rather than in procedures and findings, that the student has most of his difficulty. In some cases, it seems virtually impossible for the student to understand what is required, and this tells something about his training. Typically, the first draft of this chapter will be a paraphrasing of material from one of the popular economics textbooks. Only with considerable effort does the student finally begin to understand that applications of theory (possibly with innovations) to the particular problem selected by the student is what is required. Final results are often surprising, both to the student and the instructor. In preparing this chapter, even our best scholars often realize for the first time that classical economic theory does have some application to real world problems and can be used in a practical way.

The chapter on procedures is considered the most important one in the report. A literature review is prepared, appropriate research procedures are selected, and these are carefully reviewed by advisors.

Findings must be specified in detail and analyzed. The chapter on findings is not to contain material on how results were obtained. All of this is to be contained in procedures. Thus, a close separation of procedures and findings is required. While this may seem to be a small point, it is important. After thoroughly disposing of questions concerning how results were obtained, the student can be required to fully delineate findings, to examine and describe them and to evaluate them in light of stated objectives and hypotheses.

### WHY THE EMPHASIS ON RESEARCH

I am often asked why we place such emphasis on research at the undergraduate level. The purpose is not to encourage every undergraduate to consider graduate study and, of course, few students who do not acquire a graduate degree will be actually engaged

in research. What, then, is the purpose?

The principal purpose is to demonstrate clearly what is meant by rigorous, analytical, and incisive thinking. This is not learned easily, or taught easily. In spoonfeeding undergraduates, however, most of us have been sloppy and lazy about teaching them to think. It is not popular to try to teach "thinking" until the student reaches the graduate level and changes his attitude. The first prerequisite of good management, however, is sound, logical thinking, and planning. Where would we expect to find improved thinking and improved approaches to reliable knowledge and to superior bases for decisions? Modern research procedures probably were developed for this purpose.

We realize that very few of the undergraduates will ever have another opportunity to conduct a research study. However, the experience will affect the managerial decisionmaking process. While this is an assumption, it seems likely that once firmly demonstrated, the approach toward decisions will be made with more planning and with more realization of what data and information are required as reliable bases for decisions. In addition, as a manager, the student with the training outlined is in better position to evaluate the quality of information available to him. Our graduates become the leaders in agricultural and agribusiness circles. Some are eventually selected as advisors on agricultural policy and on USDA or state financed research. Having conducted some research himself, the perspective of the agribusiness leader (regarding kinds and types of research that are needed) is improved.

## CONCLUSIONS

More experimenting, discussion, and dialogue are needed on the question of training requirements for commercial agricultural and agribusiness management. While the undergraduate level probably needs most immediate attention, most M.S. degree programs in agricultural economics probably need to be re-examined. Not all graduate students become professional agricultural economists and an increasing number of the professionals are employed by agricultural business firms.

Approaches tried at the various schools, including the one at Texas Tech, are only a few of many possible alternatives. The first step is to realize that improvement can and must be made. We have found that, while many additional changes and improvements must be made, undergraduates can be taught to use theory and research methods effectively, they can be engaged usefully in research, and they do experience a keen sense of accomplishment in our program that usually was missing before.

In the future, it will be necessary to reach students in a more meaningful way. Students, today, want to experience personal involvement. Participation in a personal research project is one way of accomplishing this. To re-emphasize, guidance and rigorous requirements are essential. Too often, we have been guilty at the university level of accepting term papers, and papers developed out of problems courses, that high school teachers would reject. This is not the way to generate a sense of fulfillment and of respect for the training provided.

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