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Let's Look at the Problems and Challenges We Face in Meeting Agriculture's Need for Educated People

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Introduction

Last year, and again today in greater depth, we assessed the "supply-demand equation" relating to the education of people for the future of Minnesota agriculture. We are aware that a serious shortfall exists and that it will grow unless we are successful in convincing potential students of the outstanding opportunities for careers in food and agriculture, in education, science and industry. I am going to assume that we will succeed in meeting this challenge, recognizing that this is a sweeping assumption given the magnitude of the task. To give an idea of the magnitude of that task, let me quote from a computer printout used in a Minnesota secondary educational system as a tool for career counseling students in eighth grade, a time when young people are beginning to formulate their career goals. A young man had indicated an interest in a B.S. degree in agriculture as second choice to a career in math and physical science. The quote: "People who do well in this kind of work have school interests like yours. While you plan to get more education than most people entering this occupational area need, further education may help you advance to better jobs. Your pattern of aptitude test scores is higher than is usually needed for this field or work. You might do well to consider the desirability of higher occupational goals, more in line with your abilities and your expected education."

Assuming we succeed in solving the supply-demand equation, and I am confident that we will, a second equally important question arises: **Can we deliver what we promise through higher education in agriculture to students and to employers?** This question in turn, raises several others which pose critically important challenges to all of us. They concern our programs of instruction, the quality of these programs, the retention of students in these programs, and the cost-benefit of the programs to the state of Minnesota. It is these questions that I would like to briefly address.

Are Our Programs of Instruction Changing to Meet Changing Needs?

We are all aware that the food and agricultural industry is changing rapidly and radically. Although the basic thrust of the industry remains the same, that is the efficient production, processing, transport and marketing of food, the demand for food and the constraints upon its delivery, technologic, economic and social, are exploding. With this explosion we are witnessing

an exponential growth in the need for quantified information and in the development of computerized information delivery systems. Higher education in agriculture has historically served the industry very well, but do we understand the changes that are occurring now, what these changes mean in terms of the educational needs of the science and industry in the coming decades, and are we changing our instructional programs to meet these needs?

In an attempt to answer this question I will use an example from my own professional field: plant protection. The science of plant protection is about 100 years old. Instruction in the component sciences, plant pathology, nematology, entomology, and weed science, has been creditable and the people educated in them have been and are highly competent - wheat stem rust, for example, is no longer a major problem. Until fifteen years ago the conceptual goal was for "zero pests or disease" and this goal was sought irrespective of the biologic, economic or social consequences. At about this time a new conceptual goal was introduced, that of "economic thresholds," that level of control which would maximize economic yield. The imperative that caused this change was economic, biological and social (remember Rachael Carson?). This new concept was and is based upon quantification, upon integrated control strategies, upon integration of the plant protection disciplines, upon the systems approach and, hence, integration into crop production strategies, and most important, it was and is based upon computers and computerized information delivery. This approach is counted upon as one of the two primary imperatives for increasing food production, pending a major research breakthrough. Note the key words: technological change; economic and social constraint; integration; systems; communications; computer and computer programs; imperatives! In the sense of these words, and to the best of my knowledge, no such program of higher education in plant protection exists today. I could use other examples. Yet, this is the agriculture of today and will be the agriculture of tomorrow, large and small. I leave you with the question: Are our instructional programs changing to meet the need? William C. Norris, Chairman and Chief Executive Officer of the Control Data Corporation, says no and based upon this assessment CDC is investing heavily in education in agriculture.¹

Is the Quality of Higher Education in Agriculture Eroding?

In an attempt to answer this question, let me use the example of our College of Agriculture. Briefly, over the past ten years the workload expressed in student credit hours has increased by sixty percent, while the support for full year student equivalents, expressed in constant dollars, has decreased forty percent. Although the quality of faculty remains high and, obviously, the faculty has significantly improved the efficiency of their teaching, the inevitable fact is that the quality of instruction is eroding because of significantly increased workloads. Assuming that this example is not atypical and that the vitality of Minnesota agriculture is directly linked to the quality of higher education in agriculture, and this is a reasonable assumption, then it seems clear that the quality of higher education in agriculture is eroding and that it is our responsibility as accountable educators to speak out on this issue.

The issue is a national one and in the sense of the Morrill Act and the Bankhead-Jones Act it is a national responsibility. The Bankhead-Jones monies have been deleted from the Federal budget. This, I believe, is both "bad news" and "good news". Bad, because the dollars, however small, are gone. Good, because we have a new opportunity to forge a new state-federal partnership in meeting a critical national need. If, however, in solving the challenge of the erosion of program quality we place our reliance on state and federal funding only, we make a mistake. There are opportunities for private funding and private funds are probably the key to reversing erosion of quality in the short term. Moreover, if the future of Minnesota's food and agricultural industry is linked to the quality of our programs, the industry would also seem to have a responsibility. Norris sees the cooperative effort between business, government and educational institutions as the solution to the challenge, stating that "— we must assemble and configure our several technologies into a system that does what the present educational process does, but does it with capital intensive, productive technologies, rather than to drive still harder a labor-intensive process that can at best only stagger under the loads of higher needs, higher expectations, and higher and higher costs"¹ This comment also raises the question as to whether or not we have truly examined the potential of computerized information delivery systems not only to reduce teacher workloads, but also to improve program quality.

Will We Retain the Students We Have Encouraged to Enroll?

According to Robert G. Cope forty percent of the freshmen entering B.S. degree programs never graduate. Less than half of the students entering community colleges continue into second year and only twenty percent complete the A. A. degree.² These are national figures. I do not have data for higher education in agriculture in Minnesota, but I do know that the drop-out rate for our College of Agriculture approximates the national average. Retention of students is a complex question and neither the reasons nor predictors for retention are well understood. Yet, clearly, improving retention rates in our institutions has the potential for meeting our supply-demand problem and for this reason alone retention must receive our priority attention. Although the factors relating to retention are admittedly complex, two seem to be primary: academic and social. Cope² states that persistence in college is related to social-academic integration wherein students have opportunity to interact socially with their peers, the faculty and the administration outside of class in intellectually stimulating atmospheres. Fischer³ states that in the long run the answer to the problem will not be in beefed-up recruiting efforts or academic short cuts, but in the quality of the academic programs and in programs designed to meet societal needs. Thus, the solution to the retention problem would seem to depend upon the relevance of our educational program to the needs of the agricultural and food industries, to the quality of these programs, and to the reduction of faculty workload to provide opportunity for student-faculty interaction in informal intellectually stimulating situations.

Do We Understand the Value of Higher Education in Agriculture?

Understanding the value of higher education in agriculture to Minnesota is fundamental to the solution of all of the issues facing Minnesota agriculture. Dr. G. Edward Schuh, Head of the Department of Agricultural and Applied Economics has written a paper entitled, "What is the Value of a University?"⁴ In this paper, and drawing upon the econometric studies of his colleagues, Dr. Schuh describes and quantifies in a benefit/cost sense the value of higher education in agriculture. In short, education is viewed as an investment in human capital as contrasted to investment in capital inputs (land, labor, capital). The growth of agriculture in the United States over the past years has not been from increased investment in capital inputs, but from increased investment in human capital; that is, education in

agriculture. Keep in mind that growth as a result of agricultural research and as a result of extension education is directly related to higher education in agriculture. Moreover, it is pointed out that an increase in the education of the agricultural labor force is as important to increasing output as is an increase in the labor force itself. Thus, if and as enrollments in agriculture decline in Minnesota, the importance of education, and the quality of that education, as a source of continued expansion for the food and agricultural industry may become even more critical. Finally, it is pointed out that the return on this investment in human capital is shared by society as a whole. This message needs to be brought home to all, but most particularly to those responsible for making such an investment.

Conclusion

The opportunities for people in agriculture in the 80's are truly great, but the challenges for all of us to deliver the programs of education and the educational experiences of the highest possible quality are equally great. To accomplish our goals, to meet these challenges, we must develop broad understanding and renewed commitment. We need to initiate action immediately to form the new partnership that William C. Norris envisions, for we need not and should not stand alone in our efforts. Moreover, the Minnesota Council for Coordinating Education in Agriculture is and will be key to meeting these challenges statewide. This is our organization and it is serving us and the people of Minnesota well. In the coming year we must develop funding for its activities so that the MCCEA can truly serve its intended purposes. Further, we should develop new thrusts and the subjects of the discussions of this conference give a good idea of what these thrusts should be.

The challenges and opportunities are there. Can we meet the challenges and take advantage of the opportunities? I believe that we can and will. At stake is the vitality of the food and agricultural industry of the state, the strength of our nation, food for a starving world and, ultimately, world stability. **We must succeed!**

¹Norris, William C. 1978. *Via Technology, a New Era in Education*. Control Data Corporation. Publication No. 2. 8 pp. June.

²Cope, Robert G. 1978. *Why Students Stay, Why They Leave*. In *Reducing the Dropout Rate*. Lee Noel, ed., New Directions for Student Services. Jossey-Bass, Inc., San Francisco. 105 pp.

³Fischer, James J. 1978. *College Student Retention from a Presidential Perspective*. In *Reducing the Dropout Rate*. Lee Noel, ed. New Directions for Student Services. Jossey-Bass, Inc., San Francisco. 105 pp.

⁴Schuh, G. Edward. 1974. *What is the Value of a University?* Draft manuscript. Department of Agricultural and Applied Economics, University of Minnesota, St. Paul, 32 pp.

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WORKING IN THE INTERNATIONAL SCENE

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Having worked overseas for a number of years with the church and U.S.A.I.D. (United States Agency for International Development) in the capacity of "Agriculturalist" and "Extension Specialist" respectively, the most common question I get is, "How can I get a job overseas?" That's a tough one to answer, and I think there are quite a few considerations one needs to think about before diving in, but in this brief article we will examine a few aspects of working as an agricultural technical expert in third world countries. There appear to be three stages one goes through before getting into career positions overseas. People in these stages could be classified as the uninitiated lambs, the fleeced and the old rams (or ewes if you please).

In general the uninitiated lamb is quite altruistic and has a sincere desire to "do something" to make this world a bit better. In this context, we will consider the preparation that could be helpful for an undergraduate who is looking for employment in a third world country. Most frequently, U.S.A.I.D., F.A.O. and World Bank come to mind when thinking about potential employers. **But** look at the requirements! Beginning positions start with a minimum of 3 years foreign experience, a foreign language and a Master's degree. So, how do the uninitiated get initiated?

There are two common sources of employment for the beginner, nonprofit organizations, such as the church, and Peace Corps. These organizations can afford to provide the language training and initial break in period to a foreign culture because of low salaries. Some are better than others but not without trade offs. Salaries tend to be higher within the nonprofit organizations and more responsibility is delegated to the individual, but the trade off is to conform to the ideologies or theologies of the organization. A compromise in ideology may be worthwhile in order to gain more freedom to plan and implement your own program.

Peace Corps offers excellent training in language and culture adaptation, but the salary is almost nonexistent and jobs are task oriented, such as digging wells, teaching English, construction, etc. Many people in U.S.A.I.D. have started as Peace Corps Volunteers. In short, the first two to three years are for learning with low living standards, albeit rewarding experiences.

In terms of education, there is no set program to follow. However, there are some areas of study which can help. Language is quite important, although many organizations will provide training if you are hired. A good backdrop of courses would be cultural anthropology, economic planning and analysis courses, extension planning courses and perhaps a smattering of technical agricultural courses. In addition, if your goal is rural work, farm management and adult education wouldn't hurt. Now, if you have survived so far, and are thoroughly convinced and filled with missionary zeal for foreign work, you may enter into the fleeced flock.

The "fleeced" category contain people who have taken the big step and been lucky enough to find an organization that will employ the inexperienced. Being "fleeced" means being shorn of many altruistic ideals and realizing the realities of working in third world nations where death, poverty and disease are the major issues. It is a time of adapting and adjusting to working with government bureaucracies with all the accompanying frustrations. Many things become of fleeced lambs. Some are kept and fattened because of stamina in quality and some head for slaughter. For those destined for fattening, the next step is usually the Personal Services Contract with U.S.A.I.D. or a consulting firm. These contracts are normally for two years and are on competitive salary scales for comparable jobs in the states plus cost of living adjustments. Not bad, but with little job security. Each two years comes the prospect of unemployment. In addition, this is the time to get a Master's degree to stay competitive. After a few years one may be ready to make the big step into the fold of the Ram's Club.

What happened to the others? Well they normally find that foreign work is not acceptable. Unfortunately, it took a couple of years to find that out. C'est la vie. At best, it's an adventure.

So, finally we arrive at the golden gates, a lifetime career. Normally a "Dr." before one's name and 5-7 years of experience is required. Pay is not too bad and the fringe benefits are great. Chances are that this position will be with U.S.A.I.D., F.A.O. or World Bank as a full time bureaucrat. Field work becomes less and less.

Another alternative at this stage is to go the consultancy route, which is like a perpetual contract cycle. The pay is good, and if you are a risk taker it may be suitable. Don't be surprised if you find yourself unemployed from time to time.

There's no real solid advice. Foreign work is a high risk occupation, at least until one can get nestled into a government bureaucracy. It's also very rewarding. Personally, I love it and hope to work into the old goats' club (oops, I mean rams') one day.