TEACHING FARM MANAGEMENT INTO THE 21ST CENTURY

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"*I find universal belief in fairness, kindness, dignity, charity, integrity, honesty, quality, service, and patience.*" Stephen R. Covey (Kreitner p. 131)
"*I see the next century as a time when we civilize individualism.*" Robert Schuller (Brady, 1997)

ABSTRACT

The purpose of the paper is to set the environment that managers will face as we move into the 21st century and to trace the implications for farm managers and for educators. Decision making will be more interactive with electronic delivery of management training and information. Computer models will have the capacity to easily interact and communicate between modules and to use larger data bases. The interface between the decision maker and analytical computer models will be more user friendly. Computer aids will have the flexibility to add or delete modules as needed. As production becomes more integrated, management advisory services and educational programs will also be more integrated. Public and private agencies will apply their comparative advantages to produce integrated and complementary programs. There will be more emphasis on the intangibles of management such as personnel management and organizational skills. Successful managers will focus more attention on communications and monitoring performance.

INTRODUCTION

Management is the process of working with and through others to achieve organizational objectives in a changing environment (Kreitner, p. 29). The challenges for farm business managers in the next century are both difficult and exciting. Change has touched every facet of agriculture, calling for new, innovative methods of doing

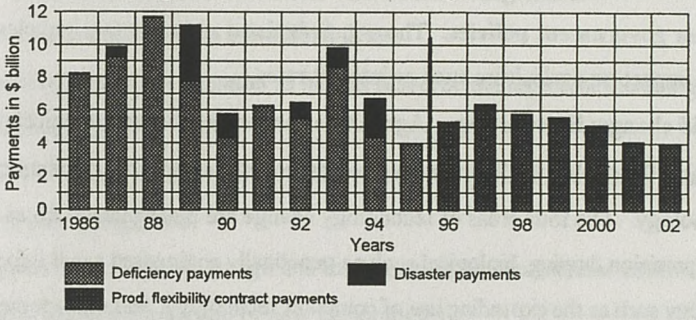
business and achieving business survival. The opening quotations underscore some of those challenges and a new emphasis for managers of sustainable agricultural businesses. Farm management has traditionally focused on budgeting, financial analysis, management of crop and livestock production systems and, more recently, risk analysis and strategic planning. There will be a continued emphasis in the next century on risk management and strategic planning but there will be increased attention on the intangible aspects of farm business management such as human resource management, group dynamics, teamwork, and negotiation skills.

A NEW MANAGEMENT ENVIRONMENT

The reason there are increasing challenges for farm managers and, hence for educators, is that the management environment is changing dramatically and quickly. These evolving changes will motivate educators to be innovative and creative. The major factors in the new operating environment are summarized below:

1. Changing government support for agriculture. The U.S. Federal Agriculture Improvement and Reform (FAIR) Act of 1996 initiated a plan to phase out the government farm support program over a period of seven years. For many years, the U.S. government made periodic ad hoc disaster payments to American farmers when perils such as drought, floods, or wide-spread insect outbreaks affected production over a wide area, usually but not always, a multi-state area. Funds for disaster payments were "off-budget." That is, they were not a part of the Department of Agriculture budget. The Crop Insurance Reform Act of 1994 virtually eliminated ad hoc disaster programs by requiring any future disaster payments be taken from the budgets of existing USDA programs. Figure 1 shows the direct government payments to U.S. farmers from 1986 through the end of the transition payments under FAIR in 2002. These payments do not include the federal subsidy in the crop insurance program.

Figure 1: U.S. Government Farm Payments, 1986-2002



2. International trade agreements and world markets. The international trade agreements like GATT and NAFTA are aimed at reducing world trade barriers. This free market orientation for storable commodities with essentially no production restrictions combined with little or no price supports creates a much more volatile marketing environment for farm managers.

3. Industrialization of agriculture. Major changes are occurring in the structure of some sectors of agriculture such as pork production. Managers have been successful in capturing the economic benefits of integration by reducing risks and adhering to rigid management systems.

4. Increasing environmental concerns. Environment is a luxury good in the sense that as our standard of living increases, the demand for preserving the environment grows. This is verified by the increased regulations on ground water supplies, air quality and other natural resources. The issue of sustainability of agriculture is becoming increasingly important. These potential restrictions could have an impact on international competitiveness as the regulations are not globally uniform.

5. Restructuring in the agribusiness sector. Consolidation in the agribusiness sector is occurring due to a number of factors. These include advances in biotechnology and the resulting integration in the chemical and seed industries and, a shift to a consumer orientation. This later phenomena has resulted in an integration of the production, processing and marketing phases of food production. Fewer operators decrease the time and cost of negotiations and enhances the ability of the

operators to control quality (Stavins and Stanton, Hallam).

6. Other government policies. These include fiscal and monetary policies which have an impact on agriculture such as interest rates.

7. Rapid changes in technology. Agriculture has seen major technological changes in the past 50 years but the future holds the prospect of even more significant changes in technology. The four areas of technology change are mechanical such as remote sensing precision farming, biological such as genetically engineered seed, information technology such as the expanding use of computer technology, and management such as the development and use of more specific decision aids.

8. Changing farm structure. Increasing farm size is a significant aspect but there are other factors which are impacting the operating environment as well. These include the ownership of production assets, particularly land, the age of operators, off-farm employment, the cost and availability of local services, and the structure of rural communities. As farm sizes have increased, capital has replaced labor but the need to hire additional labor is becoming a challenge for many operations.

9. Changing social structure. The traditional farm family structure is changing in regard to operation of the business. On many farms, the spouse works off the farm and the children pursue non-farm careers.

IMPLICATIONS FOR FARM BUSINESS MANAGEMENT

Following is a listing of some of the business issues and the resulting implications for managers and for educational programs as a result of this changing environment:

1. ***Issue:*** Increased price variability due to the dynamics of world supply and demand.
   Implication: Increased emphasis on forward pricing alternatives to reduce risk.
2. ***Issue:*** The potential reduced price competitiveness of input suppliers.
   Implications: Increased emphasis on ability to negotiate purchasing, production and marketing arrangements.
3. ***Issue:*** The availability of production resources, particularly land.
   Implications: More aggressive arrangements to guarantee long run availability of

resources and changes in traditional land rental arrangements.

4. ***Issue:*** The need to have more hired labor.

   Implications: More attention to human resource management including family relationships.

5. ***Issue:*** Changes in asset values and the ability to generate sufficient cash flow to meet debt obligations.

   Implications: Need to design and implement effective financial control systems.

6. ***Issue:*** Rapid introduction of new technologies.

   Implications: The need to analyze new technologies to determine which technologies are appropriate and economically efficient for a specific operation.

7. ***Issue:*** The industrialization of agriculture.

   Implications: Ability to be competitive but also capture the economic benefits of integrated production.

8. ***Issue:*** Dynamics of a global economy and the impact of world trade agreements on agriculture.

   Implications: An enlightened need to assess the impact of world events and political decision on specific agriculture sectors.

WHO WILL WE BE TEACHING?

The questions of who will do the teaching and who will be taught are directly related. My focus is on adult education as opposed to traditional university degree programs. The public sector will be under increased competition from the private sector for the farm manager audience for a number of reasons. We often hear that the private sector can offer inducements such as meals and other incentives to attract farm managers to education related activities. I believe this is only one factor. The advantage of private sector activities to the farmer is that a direct service is often offered along with information. Public sector programs also still have the disadvantage of appealing to a broad range of participants in terms of previous knowledge level, size of operation, financial structure and intensity of interest in management topics. Private sector activities tend to focus on larger operations where

the potential payoff per operation is much greater.

CHARACTERISTICS OF SUCCESSFUL MANAGERS

Kreitner (p. 29) points out that mangers are effective if they reach a stated objective and efficient if limited resources are not wasted in the process. The next step is to assess how mangers achieve these criteria. The traditional way of defining what mangers do is to use the functional approach. Kreitner (p. 15) defines eight functions: planning, decision making, organizing, staffing, communicating, motivating, leading, and controlling. This approach has been criticized by Mintzberg (Kreitner) as not specifying what managers actually do. Mintzberg specified ten managerial roles composed of the three interpersonal roles of figurehead, leader and liaison; the three informational roles of nerve center, disseminator and spokesperson; and the four decisional roles of entrepreneur, disturbance handler, resource allocator and negotiator. This highlights the importance of communications and organizational skills in actual business management.

Klinefelter (1997) has identified characteristics of farm managers which contribute to success. These characteristics are consistent with the roles Minterberg identified. Successful managers:

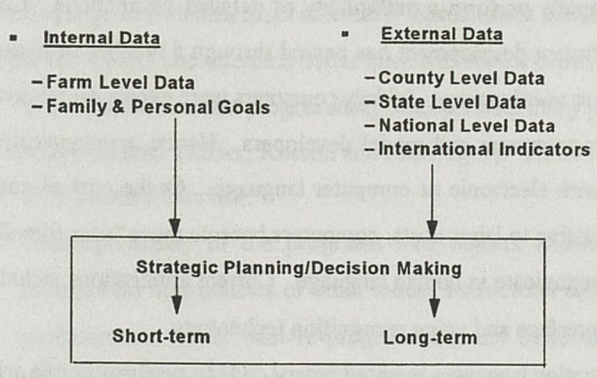
1. Objectively assess the strengths and weaknesses of themselves and others.
2. Consider themselves a head coach (motivator) rather than a boss (controller).
3. Work hard at communication.
4. Network with other managers.
5. Seek creative solutions for business decisions and consider change as an opportunity.
6. Are strategic thinkers and adapt to changing markets.
7. Consider many possible outcomes and develop contingency plans.
8. Allocate more time than other mangers monitoring and analyzing business performance.
9. Operate as resource managers rather than producers.

10. Analyze operation as a system rather than set of independent components.

FARM MANAGEMENT DECISION MODELS

The management decision process requires three components before a decision can be made. They are data sources, analysis or decision models, and the interface between the first two. This is shown schematically in Figure 2. The discussion in this paper will focus primarily on information technology and computerization and the implications for instructional materials and processes in the future.

Figure 2: Computer Aided Decision Model For Farm Management



Data Sources

The data sources include internal or on-farm sources and external or off-farm sources. Farm records, as a major source of on-farm data, have been at the center of farm management teaching since it became a field of study. The goals and mission of the family, business, and business partners is another important internal data set.

Another source of data is on-farm research. As farm sizes increase, the solution to some problems and the analysis of new techniques and technologies

becomes more specific to individual farms. The urgency to determine the applicability to an individual farm is also critical. Successful operators will be innovators in determining the optimum practices for their operation. Research results, either from public or private research, often do not get conveyed to individual operations in an expedient manner, or at least in a time frame that is consistent with the dynamic changes occurring in agriculture. The payoff to the public expenditure to assist farmers to conduct on-farm research is relatively high. Lubben and Jose (1995) found that the internal rate of return for 40 participants was 28.1%. If the number of participants in the project had been 80, the rate of return on the combined investment in the project was projected to be 39.1%.

Computer Based Decision Tools

Computers became popular for farm management decision models because of their ability to rapidly perform a multiplicity of detailed calculations. Computer language and software development has passed through a number of phases from machine language to user language. Initially computers were expensive relative to the labor cost for programmers and model developers. Hence, communication with computers was with electronic or computer language. As the cost of computing power declined relative to labor costs, computers became more "user friendly" with the ability to communicate in human language. Current applications include touch sensitive screen interface and voice recognition technology.

First generation languages required binary code to perform simple arithmetic functions. Second generation languages were assembly languages where a human language word produced the equivalent binary code for the computer. This lead to the third generation languages such as Fortran, PASCAL, COBOL, BASIC and C which captured more of the computing power of the machine. The fourth generation of languages have incorporated the concept of object orientation. This concept organizes the program through a set of conceptually well defined objects which communicate and interact easily among themselves to perform a given task. The third generation applications emphasized sequential procedures and sub-routines while the fourth generation languages emphasize the objectivity of the task to be performed.

The specific languages include Small Talk, Delphi, Object Pascal, Visual Basic and Power Builder.

Farm management computer applications have evolved through many phases including linear programming applications, farm accounting programs, and simulation models to more integrated programs such as FINPACK, FLIPSIM, and CROPSTEM. The advent of spreadsheets allowed managers to design decision aids to address their specific needs and questions without the need to learn a programming language. While computers have the advantage of manipulating a large amount of data and analyzing many alternatives quickly, the applicability of decision aids have depended on the creator's model and paradigm. Any changes in policy or underlying conditions required the model to be re-programmed. Program updates have been a problem for both developers and users. Another constraint has been the ability to interface the application program with data bases efficiently. Spreadsheet templates have had wide usage but the update and interface issues have still been a constraint.

The Object-Orientated programming concepts offer many potential advantages for future applications (Müler, Korson and McGregor). These include:

1. User friendly interface.
2. Decomposability of the programs into objects which makes it easy to incorporate new policies or other model's structural changes as add-ons or replacements rather than re-programming the basic model. The primary advantage of such methodology is the re-usability of objects.
3. Hiding the unnecessary information and program details from the end-user.
4. Flexibility to add or delete modules as needed or as situation changes.
5. Efficiency to interface with local and distributed databases.

The Data-Analysis Interface

Communications technology has simplified the process of accessing external data bases and incorporating them into applications programs. Farm business management examples include weather statistics; price series including cash prices, futures prices, and basis data; and, national and international production and utilization data. These data series are available from a variety of sources such as

governments, lenders, retailers, universities, quasi-public agencies and commercial data networks such as DTN. These dynamic links are not fully operational now but hold great potential to become an integral part of farm decisions processes in the near future. Dedicated application servers with standardized features and functions will enable managers to use more sophisticated decision tools and not be hampered the technical details of "getting programs to run." Also, network computing makes it possible to use applications on the network server rather than having them stored on the user's computer.

INSTRUCTIONAL DESIGN

The topic of how will we be teaching farm management in the 21st century could encompass a series of papers. The changes in the operating environment suggest that the need to integrate information will become more critical. Effective learning techniques are an important consideration in designing educational programs and supporting materials . Based on studies of how people learn, Phillips (1955) specified retention rates according to the method of learning as follows:

Learner Activity	Retention Rate
Read	20%
Hear	20%
See	30%
Hear and See	50%
Say	70%
Do	90%

Just as managers must be adaptable, educators must also be flexible and be prepared to use multiple techniques. Space does not permit an exhaustive discussion of teaching techniques. Following are the five points I wish to emphasize:

1. Electronic delivery methods. Recent trends indicate farm managers are adopting and utilizing computer technology at a much more rapid rate than at any time in the past 20 years. This is due, in part, to the changes in computer technology discussed earlier. Internet will be an important vehicle to deliver educational opportunities to managers.

2. Distance education. The ability to bring many resources from anywhere in the world into the home or office of a manager is compelling. Arrangements with local specialists and non-toll telephone lines can reduce the problem of not having personal access to the instructor.

3. Home study courses. This is an old technique but a project on beef cow management in Nebraska has been so successful that a third level of course modules is now being developed.

4. Joint participation by family members and business partners. Experience has shown that management educational activities are more productive if all partners including family members jointly participate, at least in the components which entail goal setting and selecting strategic plans.

5. Emphasis on "doing" as part of the learning process. The most effective technique is to have participants use data from their own operation to complete exercises rather than use case examples. The preparation of a written plan by the manager should be the ultimate goal of the instructor.

THE ROLES OF THE PUBLIC AND PRIVATE SECTORS

Reference was made earlier to public and private sectors. The private sector will offer education activities which will be based on their specific expertise, provide an opportunity to include a complimentary service such as brokerage services or take advantage of data bases they have developed. The advantage offered by the public sector is the ability to offer balanced, unbiased activities and help managers make objective analyses of their decisions.

There will be opportunities for the public and private sectors to cooperate to the advantage of both. An example is the national effort underway in the U.S., to provide risk management educational opportunities to American farm managers. The private industry cooperators are the commodity brokerage industry, lenders, private crop insurance companies, crop insurance agents and grain dealers. Quasi-public agencies include the general farm organizations and the commodity organizations. The public sector participants are the Risk Management Agency of USDA and the

state university extension system.

CONCLUSIONS

Managers face a challenging operating environment which will have a significant impact on the types of decisions they will make and the educational activities they will need to help them achieve their goals. There will be increased needs in the areas of risk analysis and management, human resource management, the analysis of new technologies, and financial control. Additional demands on managers include the need to be an organizer, negotiator, motivator, communicator, and mediator. There will be increased emphasis on the management of the intangibles as opposed to the traditional emphasis on management of the tangibles in the farm business. This is verified by characteristics of successful farm business managers. These characteristics include the ability to assess the strengths of business associates, working hard at communications, devoting time and effort to finding creative solutions for business decisions, and the commitment to develop contingency plans.

Computer technology will soon take us to the next stage in computer-assisted decision aids. There will be increased capacity to interact with a variety of decisions models and to effectively utilize large data bases. The interface between data and analytical models will be more efficient, reliable and adaptable.

Educational programs should be based on participant involvement to take advantage of the retention rate of application activities as opposed to only reading, listening or seeing. Electronic technology will also be utilized in the delivery of educational programs. The public sector will still have an important role in developing analytical techniques and training modules. The private sector will have a responsibility to provide current data in readily useable forms.

These developments will create an exciting environment for farm business educators and researchers as well as managers. The challenge for educators is to be as creative as the most successful managers.

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