

MEGATRENDS IMPACTING AGRICULTURE

by  
Michael Boehlje



**Department of Agricultural and Applied Economics**

University of Minnesota  
Institute of Agriculture, Forestry and Home Economics  
St. Paul, Minnesota 55108

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Major changes and adjustments are occurring in the agricultural sector. In this paper, we identify ten forces or trends that are likely to shape the future of U.S. and world agriculture. This brief discussion will summarize these trends and develop implications for farm and agribusiness firms.

### Internationalization of Agriculture

The first force or trend is the internationalization of the agricultural sector. Certainly we are all aware of the international commodity markets, the importance of exports to the agricultural sector, and the GATT negotiations--the General Agreement on Tariffs and Trade--currently underway which will significantly impact the competitive position of U.S. agriculture if we move to a freer and more open market. However, international trade and commodity markets are only one of four dimensions of the internationalization of agriculture.

The second international dimension concerns the input markets. We have substantial off-shore "sourcing" of agricultural inputs. Potash is imported from Canada and other fertilizer materials and chemicals from other parts of the world. Much of our farm machinery is manufactured or assembled outside the U.S.

A third dimension of the internationalization of agriculture is the globalization of the financial markets. What happens to interest rates in Europe and other countries impacts the U.S. agricultural sector as it influences interest rates in the international financial and foreign exchange markets. And, certainly, lending policies of international financial agencies are important to agricultural trade. But the international financial dimension of agriculture is more than the impact of

the World Bank, International Monetary Fund, exchange rates, and inflation on agriculture and trade. Lending institutions from Netherlands and France in particular are making loans to U.S. farmers and agricultural businesses in direct competition with traditional U.S. lenders.

A fourth dimension of the internationalization of agriculture concerns research and development activity. The U.S. no longer dominates research and development in agriculture as we did in the 1960s. In the 1960s, the U.S. was the primary investor of both public and private sector dollars in research and development. The USDA land grant/university complex and private firms, such as seed and fertilizer companies, focused on U.S. conditions and dominated the market. But now agricultural research, development, and technology is international-- the U.S. no longer dominates. There are firms doing agricultural research in Europe, both North and South America, and Pacific Rim countries--in effect, all over the world.

We must stay both cooperative and competitive in international research and development activities. For example, our international linkages mean that we have access to a wide variety of germplasm sources. It also means that if we ban new technology, such as growth hormones, other countries can improve their competitive advantage even more.

Should the United States and international lending agencies help other countries develop their agricultural production, especially when they compete with U.S. farm products? Groups such as commodity

organizations argue that we're helping the competition. But the counter-argument is that if we expect to export farm commodities to other countries, they must generate income from their primary industry--agriculture--to have the funds to buy from us. With specific commodities, like the soybean industry in Brazil, there is direct competition. But, generally, as income in developing countries goes up from their own agricultural sector, they buy more U.S. products to upgrade their diets.

In the long run, our international competitive position may not be primarily a function of our soils and climate, but a function of how effectively we compete with other countries in research and development and in developing new technology.

#### Restructuring of Farm and Agribusiness Firms

As we look to the future, a second critical trend in the agricultural sector is the restructuring of farm and agribusiness firms. We see significant numbers of mergers and consolidations occurring in the input supply, production and product processing industries. Much of the consolidation is an attempt to use fixed resources more efficiently. In general, we have had redundancy and excess plant capacity in much of the agricultural and ag-related industries.

In addition to mergers and consolidations, we see recycling on the part of many farm firms. The expectation was that many farmers would leave the agricultural sector because of financial stress during the early 1980s. But instead, we see farmers recycling. For example, large scale producers are downsizing to smaller scale operations, but

maintaining their status as a farming operation. Full-time farmers are becoming part-time farmers; owner-operators are becoming renters. Thus, so we've seen restructuring of businesses rather than significant reductions in farmers and farm numbers.

Restructuring is also occurring in terms of contract production and vertical integration of production processes. The best example of new innovations in contract production is in the swine sector. There are some that would suggest that the swine industry might follow the poultry industry in terms of contract production and vertical integration of markets.

Finally, we see significant diversification in production agriculture. Nonetheless, the "new" diversification is different than the diversified agriculture of past generations. Many farm families combine farm and off-farm employment, not only as a way to get started in farming but as a permanent and satisfying way of life. "Off-farm" income may not always come from jobs in town. Instead, it can come from creative minds and talents working in home-based businesses that have nothing to do with agriculture.

Diversified marketing and financial strategies are an important part of the new diversification. Farmers are using various methods of raising capital--not just borrowing. Longer-term leasing arrangements for land and other capital items may become an important part of the farm capital structure. Land may be leased not for one year, but on a longer-term basis as part of the operator's permanent land base. Nonfarm equity, where outside investors share risk, may become part of a

diversified financial structure that reduces a farm operator's vulnerability to financial swings. Additionally, a diversified approach to marketing that uses options, futures markets, forward contracting, and cash sales will also reduce risk.

As for production diversification, it is unlikely that farmers will go back to the era of a few chickens, some hogs, cattle, and several crops, with a total of six to ten enterprises. However, farmers will successfully combine livestock and grain operations and be very efficient with two or three production enterprises.

#### Demand Driven/Consumer Focus

A third trend and change in the agricultural sector today is a consumer, compared to a producer, focus. In the past, producers dominated the system; the expectation was that consumers would like whatever producers produced. But that's certainly not the case today--consumers now drive the production processes. The best example is the poultry industry, where growers not only produce a product that has the taste, texture, color, and nutritional characteristics that consumers want, but is packaged and processed to meet their tastes.

A consumer orientation recognizes attribute marketing. Consumers want food products that not only have the desired nutritional and health characteristics, but they also are concerned about attributes of convenience, adaptability, flexibility, and variety.

### New Technology

A fourth continuing trend in agriculture is in the development and adoption of new technology. Biotechnology and information technology are replacing the capital and mechanical technology of the past. This new technology will require a lower capital outlay and will be more size neutral than the mechanical technology of recent years. It will not only alter management strategies and production efficiency, but even the structure of the sector and the way that price and other signals are transmitted from consumers to producers.

New technology in the processing industry will facilitate the transformation of raw products to food items with the desired nutritional and quality characteristics. Further, new technology in the input manufacturing and supply industry is also critical to maintain our cost competitiveness by reducing the prices of purchased agricultural inputs. For example, significant advances in manufacturing processes and innovative uses of new materials are needed to reduce the cost of and required investment in machinery and equipment by farmers.

The development and use of new technology requires human capital. Much of the past productivity increase in agriculture has occurred not by using additional resources, but by substituting resources and using new technology. New technology really is a result of innovations and new ideas generated by scientists and businesspeople--the human capital rather than the physical capital of the agricultural sector.



### Lower Cost of Production

A fifth trend and focus of agriculture is to reduce the cost of production of agricultural products. Lower costs are a result of two forces, the first being lower input costs. In general, the prices of fertilizers, seed, chemicals, land, machinery, and equipment have declined from the high levels of the late-1970s and early-1980s. Furthermore, farmers are using inputs more efficiently; witness the lower levels of fertilizer and chemical use of many producers without sacrificing yields. Reduced chemical use is not only a response to concerns about cost containment, it recognizes the growing concerns about groundwater pollution and environmental degradation that are increasingly attributable to agricultural production practices. Lower input prices and improved utilization of inputs have resulted in improvements in farmers' financial performance and the U.S. competitive position in international commodity markets as well.

### Diversity

A sixth trend in agriculture is the diversity in the farm sector. It used to be that averages adequately described the sector. Farms were quite similar and a normal or bell curve distribution, where many farmers were close to the average, was an accurate description of agriculture. But that's certainly not the case today. Wide diversity exists within the agricultural sector, not only in terms of enterprises but also in terms of size, volume, efficiency, financial performance, managerial ability, leverage, production technology, etc.

From a marketing perspective, farming has become a segmented market. Two very specific segments of the market are full-time large scale farmers and part-time farmers. The products and services that large scale and small scale farmers want and need are different. The cost of servicing large scale farmers is different than small scale farmers. With the increased diversity in the agricultural sector, concepts of market segmentation, niche marketing, and differential pricing become important.

#### Capitalization of Agriculture

The capitalization of agriculture is a seventh area of change and challenge that must be faced today. As noted earlier, innovative financing arrangements are being used to capitalize the production as well as the input supply and product processing sectors. With these new financing options, the question of the optimum utilization of debt and equity is being reevaluated. Farm and agribusiness firms have become increasingly aware in recent years of the risk and cost of debt utilization. Alternatives to debt, such as leasing and modified debt instruments that reduce the risk exposure such as adjustable term (rather than rate) loans, are being evaluated. With the substantial losses of recent years for many farm and input supply firms, rebuilding the equity base has become a significant challenge.

New financial institutions are also considering entry into the agricultural market. International financial institutions like Rabobank in the Netherlands and Credit Agricole in France are assessing the potential of expanding their loan programs for U.S. farm and agri-

business firms. Furthermore, input supply firms such as Deere, Purina, Farmland, and Cargill are aggressively marketing point of sale (POS) full season financing for seed, feed, fertilizer, chemicals, etc., in direct competition with traditional commercial bank and Farm Credit System lending institutions.

### Strategic Planning

An extremely important challenge that must be confronted in agriculture is strategic planning. Farmers and the agribusiness sector suffer from what might be called a "hit the wall" syndrome--changes in direction don't occur until major and dramatic problems are encountered. Instead, the focus should be on strategic planning--emphasizing the strengths and weaknesses of the firm and the opportunities and threats of the environment. This focus requires long-run planning, and thinking about the next 3-5 years and how the business fits in international, as well as domestic, markets.

When the focus is on strategic planning, the role of information becomes critical; whereas in the past the owner of capital was in control, in today's environment the controller of information has ultimate control. Information is a critical resource, suggesting that significant outlays to obtain information will have a high payoff.

Strategic planning also implies scenarios--thinking about the future not in terms of just a single expectation, but thinking in terms of two or three alternative futures. Planning for these alternatives requires the development of contingency plans. The contingency planning concept necessitates planning for events that might occur rather than

attempting to predict the future with certainty and operating with only a single plan.

### Environmental Issues

Although farmers have generally been less impacted by environmental regulations than their business counterparts, environmental regulation is rapidly becoming a critical concern in production agriculture and the agribusiness complex. The recent expanding interest and concern for sustainable agriculture is one manifestation of this growing concern. Many producers are evaluating their use of fertilizer and chemicals to determine whether reduced amounts might be responsive to concerns about cost control as well as environmental degradation. State and federal governmental agencies are increasingly focused on regulating and monitoring both water quality and soil erosion. The 1990 Farm Bill continues the expanded conservation reserve program implemented in 1985 in an attempt to reduce the erosion of fragile lands. An expanded Swampbuster and Sodbuster program to reduce conversion of such areas to row crop production has also been implemented. Increased concern is being expressed about relationships between agricultural production practices, the environment, and wildlife habitat. Concerns about the environment are not just a passing fancy; farmers and agribusiness firms will become increasingly subject to environmental rules and regulations that will impact their management practices and, most likely, cost of production.

### Changing Agricultural Policies

Agricultural policy issues are numerous and will change over time as economic conditions and the policy environment change. Key current policy issues include dairy and commodity policy; trade policy including the current renewal of negotiations on GATT and the expansion of the U.S.-Canada Free Trade Agreement to include Mexico and Latin American countries; food safety/quality; environmental policy; and various dimensions of animal agriculture policy.

The recent decline in milk prices and the prospects that these prices will remain relatively low has put significant economic pressure on many Minnesota and upper Midwest dairy farmers. Various proposals have been developed to increase milk support prices temporarily in response to the pressures. If supplies continue to expand faster than consumption in the long run, government expenditures for milk purchases will increase and pressures will develop to either lower support prices or develop a supply management system. Current farm legislation mandates a study of various inventory control procedures; possible strategies such as quotas, a two price system, or significantly lower price supports may be proposed to reestablish a supply/demand balance. Not unrelated is the current controversy concerning the single base point pricing system that provides higher prices to producers in the Southern States in contrast to the Upper Midwest. This government mandated price differential provides economic incentives for continued production and/or expansion in the Southern States, even though lower overall prices may actually be signaling the need to reduce milk

supplies. Future policy concerning price supports for feed and food grains will also continue to be debated.

The restarting of GATT negotiations, the request by the President for extension of fast track authority in Congress so that any trade agreement must be voted on as a package without amendment, and discussions of expansion of the Free Trade Agreement between the U.S. and Canada to include Mexico have continued implications for agriculture. Most of the past discussions have focused on commodity trade, but prospects for international trade in processing, distribution, transportation, and other agricultural technology are also important. The potential to export technology is particularly relevant with respect to the developing economies of the Eastern European countries and the Soviet Union.

Issues of food safety and quality as well as those of nutrition and diet are important to the agricultural sector and to rural Minnesota. Consumers are demanding the best and most scientifically-based information available to be used in making decisions concerning the consumption of various food products.

Environmental issues will continue to be the focus of much of the legislative debate at both state and federal levels during the next few years. The 1990 Farm Bill includes language that can easily be interpreted as encouraging producers to use more "sustainable production practices" and reduce their utilization of various chemical and fertilizer inputs. It is not inconceivable that more explicit regulation at both federal and state levels on management practices that may result in environmental degradation would be implemented. The current

debate concerning wetlands regulation along with the discussion concerning CRP acreage and its eventual disposition are also important topics here. Quite likely, the policy debate concerning environmental issues has just begun and, most probably, agriculture will be a major focus of further discussions.

Finally, issues related to animal agricultural policy have not received the same focus as those related to crop agriculture in the past. Such topics as animal rights/welfare and animal handling practices in the agricultural production sector as well as the marketing/distribution channels will be one focal point of this policy debate. Another dimension will be the issues of organization and control of the livestock production system, including such topics as contract production of swine, cattle, and dairy, as well as the concentration in the meat packing industry and the implications for producer pricing and market access. Food safety/quality issues are also very much a function of concerns about both the types of management practices used in meat production and distribution and in the nutrient content and quantity of meat consumed. Regulations at both state and local levels on siting of livestock facilities, with specific concern for potential air and water pollution problems, will be important. The opportunities of an expanded livestock sector as an economic development strategy are becoming an increasingly important public policy issue. Much of the debate concerning animal agricultural policy will include individuals who have not had previous experience in policy discussions, and the participants will have a diverse set of viewpoints and interests.

Conclusion

We have presented ten forces or trends that will shape the agriculture of the future. Many of these forces will require changes and adaptations that may be difficult to accept. But, that is what agriculture traditionally and typically does well--change and adapt to the new environment.