



# The Northeast Sustainable Agriculture Working Group

P.O. BOX 608, BELCHERTOWN, MASSACHUSETTS 01007 • PHONE 413/323-4531 • FAX 413/323-9594 • NESAWG@smallfarm.org

## *Niche vs. Mainstream Markets: The Role of Industrialization in the Agricultural Production Sector*

Stewart N. Smith  
Professor of Sustainable Agriculture Policy  
University of Maine

American agriculture has been shaped by a long tradition of increasing industrialization. Ever since John Deere built his plow manufacturing plant in the 1840s and Cyrus McCormick his thresher plant shortly after, American farmers have grown increasingly dependent on non-farm input suppliers to produce their output. Several waves of technological revolutions can be identified during this industrialization process. By 1950 the tractor had replaced animal power marking the end of the dominance of the mechanical revolution. During the next forty years, the chemical revolution resulted in the replacement of crop rotations with chemical pesticides and nutrients. In all these cases, activities once performed by farmers are now done by industrial non-farm firms. The trend continues today at an even faster rate with the advance of an information and biotechnology revolution (Goodman *et. al.*).

While these revolutions had major impacts on the way we produced food, they also had major impacts on the way we marketed that food. These displacements usually resulted in farmers becoming more specialized, producing more of fewer products, requiring distribution to an ever widening consumer population. It is not surprising that the technological changes on the farm were accompanied by similar technological changes in distribution. The development of the railway,

refrigeration and numerous food processing and handling innovations provided industrial specialized farmers the opportunity to sell larger volumes of a single output.

As input firms appropriated the activities of farmers, marketers appropriated the activities of households, providing foods that were more prepared and table ready. Food manufacturing of a farm commodity into a consumer product has become the dominant characteristic of our mainstream marketing system. In this system farmers sell a commodity into an industrial food distribution system rather than sell a product to a consumer.

Not surprising, this system also results in farmers being increasingly trivialized within the food and agricultural system. I have spent some time examining the declining role of farming in American agriculture. Considering the domestic food component, the largest component of the U.S. agricultural system, the farming share declined by 78% from 1910 to 1990, with 22% going to the non-farm input sector and 56% to the marketing sector (Smith). If we are concerned about maintaining a farming sector in the food and agricultural system, we should be concerned about the industrialization process that continues practically unabated in U.S. agriculture. For example, adoption of the hormone rBST in dairy cows is

projected to result in a reduction of farming activity of 9%, even while individual farm profits are increased by 7% (Rudelitch). While I have not seen estimates of the impact of Precision Agriculture, I would guess it will be substantial. That technology, which allows the determination and control from a computer terminal of input applications specific to small areas in a field will result in substantial displacement of in-field farm management, and returns to that management.

There are alternatives to these technology choices. Most sustainable agriculture systems require more integrated cropping and crop/livestock systems. Growing grain and forages with potatoes, for example, provides feed for livestock, which provide nutrients for crops, and allows for longer rotations as a displacement for intensive pest management. In recent work we have found that integrating forage into a potato and grain rotation can increase the share of farming activity by up to 20% simply because more of the inputs into the system are provided by farmers (Smith *et. al.*).

Integrated systems, while providing more farming activities and returns to the total farming sector, are more complex to manage. It is likely that total volume output for sale from such systems will be less than for specialized systems for each individual farm. With a smaller volume but more diversified output, those farmers will have a greater incentive and capability to sell further up the marketing chain. They will look more to local consumers than distant consumers as they produce a greater diversity of products but smaller volumes of any one. They can substitute economies of scope for economies of scale and can widen their margins by adding more marketing services to their output.

Providing marketing services becomes an important component of integrated, more sustainable systems. These services take various forms. Segmenting product at the farm level is one service strategy.

Many consumers, we find, prefer specific products to commodities, and are willing to pay for that segmentation. Markets may be segmented by a number of characteristics. Some consumers prefer organic, some prefer local, some prefer specific varieties of product. We also find many consumers who prefer purchasing food from a local person with a face and place. Farmers' markets, CSAs and farm stands are all examples of farmers providing marketing services that satisfy that type of consumer preference. The techniques are several, but the underlying premise is singular. Integrated, sustainable systems require diversification which provides a greater incentive for farmers to provide more marketing services by segmenting her output and selling up the marketing chain. Niche markets become preferable to mainstream markets.

The number of farmers who can transition to these more integrated system will depend largely upon the integrating technologies available at the farm level and the potentiality of the market for more segmented farm product. As long as we focus public agricultural resources on promoting national and international markets, the less we will be able to support more sustainable technologies at the farm level. It is important that public policy place emphasis on supporting more integrating, less industrial technologies.

The current debate over using public research funds directed to sustainable agriculture to promote the development of precision agriculture is an example of the policy debates between integrated and industrial technologies. If public sustainable agriculture research funds are captured by precision agriculture proponents, the movement to more diversified integrated systems will be adversely impacted.

The role of public research takes on heightened responsibility since the private agricultural research system is unlikely to provide the kind of research

needed to make integrated systems more competitive. Currently over one half of U.S. agricultural research is provided by the private sector, primarily input and marketing firms. They are dedicated to an industrial system of increased specialization at the farm level, greater dependency on the non-farm sector and greater industrialization of the food manufacturing and distribution system. It is up to the public research system to provide technologies that promote more integrated, sustainable farming systems.

Transitioning to more integrated systems also requires consumers who prefer local farm products. Without a demand for marketing services provided by farmers, it will be difficult for integrated farmers to be competitive, given the current agricultural infrastructure which better supports more specialized, industrial farming. Local and regional food systems assume an increased role in this transition. They provide farmers the opportunity to provide more marketing services, to substitute economies of scope for economies of scale, and to widen their profit margin. Replacing more specialized industrial systems with more integrated sustainable systems will require public policy to support change in both production systems and marketing systems. Local and regional food systems where farmers can contribute marketing services must be a key component of the needed marketing change.

---

Goodman, David, Bernado Sorj, & John Wilkinson. 1987. *From Farming to Biotechnology: A Theory of Agro-Industrial Development*. Oxford, UK: Basil Blackwell Ltd.

Rudelitch, Charles J. 1998. The Projection of Maine Dairy Farms' Contribution to the Farming Sector Using a Linked Spreadsheet Model: The Case of RbST and Rotational Grazing. Staff Paper,

Department of Resource Economics and Policy, University of Maine, Orono, ME (forthcoming)

Smith, Stewart, 1993. Sustainable Agriculture and Public Policy. *Maine Policy Review* 2[1]:68-78.

Smith, Stewart; Andrew Files, Ellen Mallory & Jeff Hunt. 1998. Adding Value to Farming with Alternative Potato Production Systems. *MAFES Bulletin*. University of Maine, Orono, ME (forthcoming).