Mother Nature, Business Strategy, and Fresh Produce

by Paul N. Wilson, Gary D. Thompson, and Roberta L. Cook

You go where Mother Nature favors you.
—Mike Dresick, California-based diversified grower-shipper

In Virginia, we're growing tomatoes at the time God intended us to.
—Jay Taylor, Florida-based tomato grower-shipper

...the old cartography no longer works. It has become no more than an illusion.
—Kenichi Ohmae, *The End of the Nation State*

The fresh produce industry has led and continues to lead the evolution toward more globally networked agribusinesses where temporal diversification dominates managerial decisions. Climatic variability, the challenges of delivering highly perishable products 365 days of the year, and heterogeneous markets create unique economic opportunities for the innovative, globally networked firm.

Our thesis is that intra- and interseasonal diversification by agricultural producers and agribusiness firms provide an increasingly important means for agribusinesses, particularly in the fresh produce industry, to manage risk and take advantage of emerging market opportunities. Managers can and do diversify within and across growing seasons by seeking spatially dispersed production capacity through formal and informal contracts, strategic alliances, and/or ownership. The economics of climate (econoclimonics) in a global, industrialized agricultural sector has become a key factor in structural change and competitive advantage.

As barriers to foreign investment and trade in agricultural products continue to fall, grower-shipper firms continue to gain enhanced access to production regions and final markets throughout the world. This enhanced access allows innovative fresh produce firms the opportunity to sequence perishable fruits and vegetables from dispersed geographic areas on a year-round basis. Various market forces are driving many of these grower-shipper firms toward becoming year-round businesses.

Forces driving change in the fresh produce industry

Greater market power in the retail sector

Mergers and acquisitions in the food industry at the retail, wholesale, and food service levels over the last decade concentrated buying power at both the national and regional levels. Although many grower-shippers of fresh produce choose to sell through intermediaries (for example, brokers, wholesalers, repackers, terminal markets), innovative and growing firms sell a significant percentage of their production directly to integrated wholesale-retail buying organizations. On the upside, these arrangements with Safeway, Taco Bell, and McDonald's reduce market uncertainty and spread overhead costs over a known level of units. On the downside, these grower-shippers interact with fewer and younger buyers who are often more loyal to their computer-generated buying programs than to any grower-shipper. Supermarket chains and food service firms try to dictate price, discounts, packaging, delivery schedules, quality, and in some instances, varieties. To the chagrin of many grower-shippers, the corporate food trade, through its supermarket and retail buyers, increasingly drives the

economics of the fresh produce industry. Yet some grower-shippers have turned this trend into a competitive advantage by forging close relationships with these powerful customers.

A year-round shipping advantage

In response to market power and market opportunity in the retail and food service sectors, many shippers of fresh produce extend their traditional growing seasons beyond the climatic constraints of their home regions. Some shippers have been "forced" by competitive pressures to become year-round suppliers while others have been early adopters of an extended season shipping strategy. Others have chosen to remain solely in the traditional season. For the grower-shippers opting for year-round production, new profit opportunities arise for contracting with retail firms, opening new national and international markets, and spreading the overhead costs of a professional staff over more months and units of production. As illustrated in figure 1, the traditional lower-risk July-August season, when melon prices usually do not change as much as in other months, may or may not produce profits for the melon grower-shipper. Yet off-season, higher-risk production, with higher costs, lower sales volume, and more variable melon prices, can offset any losses during the summer months because melons usually fetch higher prices in the "off season." By extending the season, the firm expects to increase annual profitability, although losses may occur regularly during several weeks or months of the year.

Demand for product merchandising

With incentives to work throughout the year with powerful retail and food service firms, some grower-shippers of fresh produce have invested in consumer-oriented merchandising efforts. Market research, alternative packaging, product differentiation, and point-of-sale promotion and education become ongoing programs for capturing new market segments and enhancing market share. In the future, category management programs implemented by retailers and electronic data interchange between retailers and shippers may lead to more loyalty and economic ties than currently exist. Yet for many production-oriented grower-shippers any investment in product marketing is viewed with suspicion. The merchandising of fresh produce represents a brave new challenge with uncertain benefits at the grower-shipper level. But if the consumer-driven food industry demands these merchandising services, the early adopters will reap greater market shares and improved shipper-retailer relationships.

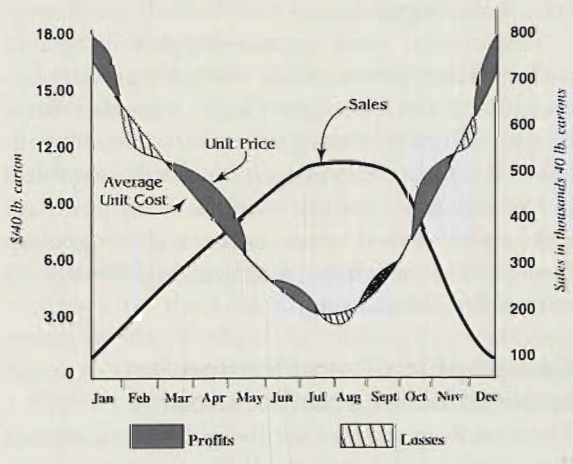

Figure 1. Stylized annual cost/revenue stream for year-round melon grower-shipper

Biological technology

The technological treadmill created by modern molecular biology represents another driving force in the fresh produce industry. Modern plant breeding and genetic engineering have created an industry based on climatic precision. Melon, lettuce, and tomato varieties exist for specific planting dates (a two-week window, for example) in a narrow climatic zone (melons near the shore of the Salton Sea in the Imperial Valley, California, for example). Grower-shippers work with multiple varieties in commercial production while testing dozens of new varieties experimentally every year.

Varieties with specific biological characteristics make increased product differentiation feasible. For example, biological scientists continually improve lettuce and melon varieties for better utilization in fresh processed products such as bagged, refrigerated salads. Through proprietary developments, seed companies dominate the flow of biological and agronomic information which permit climatic precision and enhanced product differentiation. Private companies almost exclusively provide the information necessary for these new proprietary developments, with land grant universities playing a second-

ary role in developing new technology. The biological technology embodied in these proprietary seed developments facilitates profitable production in a wide range of microclimates, a key factor allowing geographically diversified firms to augment their profits by supplying their customers 365 days a year.

Vertically coordinated grower-shippers

These driving forces in the fresh produce industry jointly pressure grower-shippers to increase the coordination and integration of their growing, sales, and merchandising activities. Extended season and year-round shipping and sales require carefully coordinated sequential growing from dispersed geographical areas, often over long distances and even across international borders. If grower-shippers promise their buyers consistent quantity and quality of perishable products throughout the year, they must be assured that growing is properly scheduled over dispersed areas to provide a smooth, consistent flow of produce. With highly perishable produce, any crop failures can result in gaps in shipments, disappointed customers, and a possible loss in market share.

Vertically coordinated and integrated firms also assure clear transmission of market information back to growing operations. Merchandising efforts such as product differentiation through innovations in seed varieties and in-store promotion can be planned and implemented with more assurance within a vertically coordinated operation than through arms-length market transactions between firms. The added investments necessary for seed development and merchandising may not be justified for a seasonal grower, but a year-round grower-shipper is capable of defraying these costs over more units throughout the year, capturing gains from proprietary technology.

Historically, some grower-shippers integrated backward into growing from wholesale produce operations on the U.S. East Coast. Yet other firms integrated forward from growing into sales. Regardless of the direction of integration, the driving forces in the industry continue to press many firms toward more vertical coordination and integration, from seed development and growing through to sales and merchandising.

Geographic diversification: an application of econoclimonics

The American public often visualizes commercial farms as farmsteads surrounded by contiguous acreage owned and operated by the family. While this

vision of American agriculture remains accurate for selected regions of the country, we argue that this perception is misleading for significant portions of the agricultural and agribusiness sectors. Our thesis is that a global, industrialized agriculture relies on climatic diversity within and across areas to manage yield risk and meet year-round market demands far more frequently than most people realize. The fresh produce industry is a case in point.

Intraseasonal diversification

To appreciate the significance of intraseasonal diversification, we can analyze the four-to-six-week melon season in the Imperial Valley, California. We illustrate four distinctive microclimates in figure 2a. Initial plantings occur near the Salton Sea in February because of warmer temperatures at low elevation near the water (235 feet below sea level). Plastic-covered and/or south-sloping beds may accelerate plant development by a week or two in this microclimate. Then the grower-shipper will move toward slightly higher elevations (+100 feet) in the central and southern parts of the valley, completing planting operations on higher ground (+250 feet) in the eastern section of the valley. Land values and rental rates reflect the economic rents associated with location. Ground near the Salton Sea demands a premium due to the area's ability to deliver melons for an early season market window. Managers devote a significant amount of time to securing acreage in each microclimatic region with land rental agreements reached on a handshake or by formal contract.

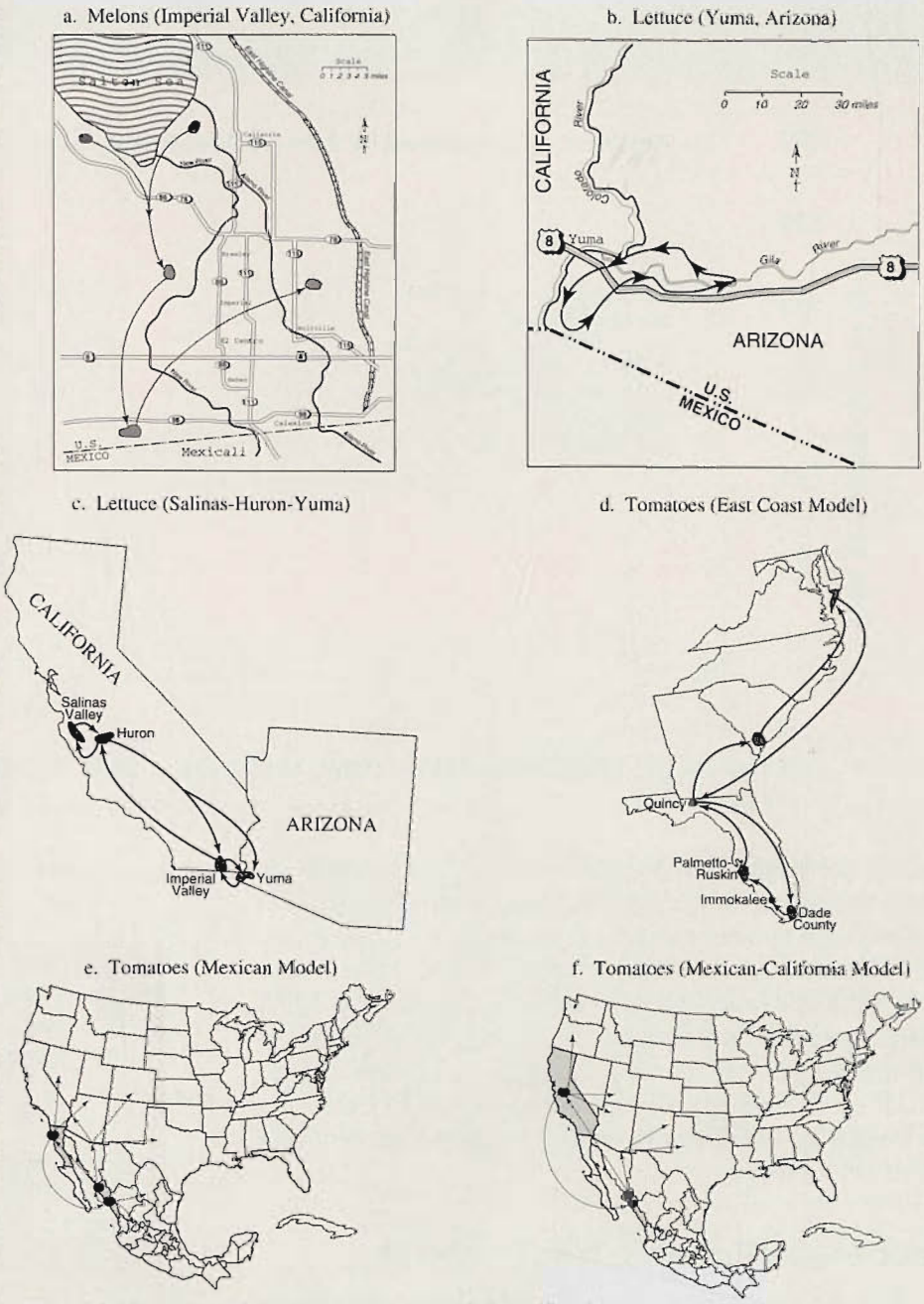

Figure 2. Examples of intra- and interseasonal diversification

Lettuce production in Yuma, Arizona, from November through March represents a continuous path of intraseasonal diversification (figure 2b). Major California-based grower-shippers initiate planting in the upper Gila River Valley in the early fall, moving down the river to the Yuma Valley, then toward the Mexican border, and then working their way back up the Gila River to finish the harvest season in March where they started in November. Access to farmland in this region is obtained through a plethora of contractual arrangements with local growers and through direct ownership of the lands. The lettuce varieties change for each distinctive microclimate within this thirty-mile zone.

Interseasonal diversification

The nation's consumers can purchase lettuce every day of the year due to interseasonal diversification by California-based grower-shippers (figure 2c). The production area around Huron, California, represents a two-way climatic bridge between the distinctive climatic regions of the Salinas Valley and the Yuma/Imperial Valley desert area. Huron-based production plays a key role for no more than two to three months of the year: first in April as the industry moves from the Yuma/Imperial desert area to Salinas and then in October as the industry moves back to the desert. Without this climatic bridge, consumers would experience significantly higher let-

(continued on p. 24)

(continued from p. 21)
tuce prices in the spring and fall months.

Multiple models of interseasonal diversification characterize the fresh tomato industry. Many grower-shippers organize themselves geographically to insure a year-round market presence. For example, a Florida-based tomato grower-shipper may produce tomatoes (and most likely other fresh vegetables) in Dade County, Immokalee, Palmetto-Ruskin, Quincy, as well as South Carolina and Maryland or Virginia (figure 2d). This East Coast model of organization keeps the firms in the large eastern produce markets all year long. Again, a variety of contractual arrangements and/or ownership provides access to acreage in all these areas. Some Mexican grower-shippers diversify intraseasonally by growing in both the Culiacán and Los Mochis areas of Sinaloa and interseasonally diversify by shipping tomatoes out of Baja California Norte in the summer and fall (figure 2e).

Finally, some grower-shipper firms follow a North American model of sourcing their tomatoes (figure 2f). In this case tomatoes are produced year-round under grower-shipper direction: from Mexico in the winter months (December-April) and in various locations in California the remainder of the year. While only a few California-, Florida-, and Mexico-based firms are North American tomato firms, other grower-shippers in each region are exploring the challenges and opportunities associated with interseasonal diversification.

Harry Ayer

Economic implications

What is a firm?

Traditional approaches to farm and agribusiness economic analysis treat the decision unit as a self-contained economic organization responding to impersonal market forces. Our experience in the fresh produce industry reveals many limitations of this traditional approach. Vertically coordinated grower-shippers establish and maintain an intricate set of business relationships that form a managerial web of cooperative alliances. As an executive of a major California lettuce firm commented, "The produce industry is based on relationships, relationships, relationships." These alliances and relationships continually alter what is biologically and technically feasible while allowing grower-shippers to develop and merchandise differentiated products. The effective management of these cooperative arrangements is essential for the competitive strategy of these firms. Any competitive analysis that ignores the current and future role of alliances and cooperation will struggle to describe or predict firm-level decisions accurately.

Climate-driven value added

Microclimate access and management dominates production decisions in the fresh produce industry as grower-shippers respond to the increasing market power of buyers and consumer demands for a high-quality, year-round, well-merchandised product. More financial and organizational resources will flow into forging partnerships with existing firms and/or exploring and opening up new production regions in the United States, Mexico, and Central and South America. Understanding "where Mother Nature favors you" will produce value for the firm. Increasingly, firms will devote additional resources to the production of microclimate-specific proprietary technology, primarily in seed development. The development and adoption of Israeli extended-shelf-life, vine-ripe tomatoes by the Mexican industry over the last five years is a classic example of adding value to a product through the synergistic interaction of climate and genetic manipulation.

Fuzziness of trade disputes

Seasonal competitiveness in trade disputes is often measured by representative budgets which calculate costs of production and returns for specific regions over a designated season. If all firms are regarded as seasonal grower-shippers limited to a single area, estimates of costs and returns for that area's season will bias inferences about the competitive position of the longer season or year-round firms. In the case of our hypothetical year-round melon producer in figure 1, cost and return estimates during July and August would indicate losses, but profits in other areas and seasons can outweigh these losses. Many grower-shippers meet "the test of capital" by organizing and capitalizing the firm to weather adverse economic periods. These grower-shippers take advantage of extremely lucrative markets that result from natural disasters like the April 1994 flood in Salinas, California, or acute whitefly infestations in the Imperial Valley in the early 1990s. We argue that only annual, biannual or triannual measures of costs and revenues for all entities in the temporally diversified firm can reveal an accurate economic measure of profitability.

An increasing number of grower-shippers of fresh produce (melons, tomatoes, etc.) have developed strategic business alliances across climatic regions. With competitive microclimates in foreign countries, the expected returns to seasonal diversification can outweigh the costs associated with foreign-based production and trade. So with even greater liberalization of world trade expected in the future, we expect more firms will seek greater profits through climatic diversification across international boundaries. As a result, the inevitable bilateral trade disputes will feature firms with operations or strategic alliances in both countries. A recent case is the fresh tomato dispute between the Florida-based industry and Mexican grower-shippers based in Culiacán, Sinaloa. Three globally networked tomato firms, two from the United States and one from Mexico, find themselves producing tomatoes in California and/or Florida and Mexico. These innovative, globally networked firms are the losers with any new barriers to trade, as are all consumers of fresh tomatoes. ◘

■ For more information

Another application of econoclimonics can be found in the following:

Thompson, G.D., and P.N. Wilson. "Common Property as an Institutional Response to Environmental Variability." *Contemp. Econ. Policy* 12(1994):10–21.

Other complementary agribusiness analyses are as follows:

Boehlje, M. "Industrialization of Agriculture: What are the Implications?" *Choices*, Fourth Quarter, 1996, pp. 30–33.

Goldberg, R. "New International Linkages Shaping the U.S. Food System." *Choices*, Fourth Quarter 1993, pp. 15–17.

Jones, W.O. "A Case Study in Risk Distribution: The California Lettuce Industry." *J. of Farm Econ.* 33(1951):235–41.

Ohmae, K. *The End of the Nation State: The Rise of Regional Economies.* New York: The Free Press, 1995.

van Duren, E., W. Howard, and H. McKay. "Forging Vertical Strategic Alliances." *Choices*, Fourth Quarter 1995, pp. 30–33.

About our research

Our research identified the strategies and organizational approaches grower-shippers of fresh vegetables in the western United States and Mexico have adopted to maintain a competitive edge in North American markets.

Our research team interviewed eighty-one owners and executives of grower-shipper firms in California, Arizona, Mexico, and Florida. Only one of these firms is publicly traded; the rest are closely held, family-controlled operations. We elicited qualitative and quantitative information regarding production and marketing organization and strategies by using the same protocol for all interviews. We also obtained complementary information from a brief data form completed by personnel in the firms. The primary data collected in this fashion reveals important industry trends at which secondary data can only hint.

The firms selected grow and ship lettuces, tomatoes, and melons throughout the United States, Canada, Mexico, and abroad. The lettuce firms interviewed in California and Arizona represent 80 percent of the lettuce shipped annually. We interviewed tomato firms with operations in California, Sinaloa and Baja California, Mexico, and Florida, representing approximately 75 percent of the tomatoes shipped annually in the United States. The melon grower-shippers interviewed in California, Arizona, and Mexico accounted for 60 percent of the cantaloupe, honeydew, and mixed melon acreage in their production regions.

The Cooperative State Research and Extension Service of the U.S. Department of Agriculture sponsored our research.

The authors are, respectively, professor and associate professor, Department of Agricultural and Resource Economics, The University of Arizona, and extension economist, Department of Agricultural Economics, University of California, Davis.