

Quote: In Europe, governments and supermarket chains, pushed by consumer organizations, will limit the use of pesticides earlier than we believe.

Apple Market and Product Innovation in Europe

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The European apple market is characterized by the following strong points:

- The European market for fresh apples is the largest in the world. Its production is annually around 8 million tons. This represents an annual value (at consumer prices) of US\$ 7 billion. With the new market outlets developed in the former eastern European countries and Russia, total consumption has been increased to 15 million tons.
- "An apple a day" The product has a healthy image.
- From the market there exists an increasing demand for products and technology, both on product and marketing levels.

and by the following weak points:

- European apple production is not at all market oriented. Profitability falls at the farmers' level while profit margins increase at the distribution level.
- Early crop estimations are not sales oriented. They give only information on quantities for sale. They give no information on disposal time or on the quality features. As such, they support the idea of a structural overproduction.
- The marketing strategy is still a push strategy. Because the market for fresh apples can be characterized as a buyer's market, more added value will return to producers with a change to a pull strategy.

THE ACTUAL MARKETING STRATEGY

The actual marketing strategy is based on sales of what is easiest to grow, store, grade and transport. Every fruit-producing area in Europe tries to promote its locally grown product by private labeling over a far too long period in time. By doing so, it tries to convince the market about the better quality product grown. As a result of this strategy, Europe's production is differentiated over many areas but always very much oriented to a single variety. Modern CA

storage encourages a longer sales season without guaranteeing the quality of the product over time. By the use of private labels, cooperatives promote the origin of the product. These labels have no value in terms of fruit quality.

Due to this market strategy, every area in Europe that produces other varieties becomes a competitor in the market. Moreover, differentiating the same variety from different areas by the use of the private labels puts even more pressure on the prices. This helps explain why in the market ruled by supermarket demand the price structure for apples has been eroded so quickly.

This market strategy is based on a producer's point of view. Producers have known a satisfactory performance in a market that was characterized by a shortage of produce and with uninformed partners. On the other hand, it failed completely because it did not predict the overproduction.

THE NEW MARKETING STRATEGY

During recent years the market for fresh fruit in Europe has been changed completely. Demand is more consumer oriented in supermarkets. The customers-buyer gets smaller in number, but better informed, better organized and the most competitive partner.

Supermarkets stress their vision for global supply of superior quality. Fruits and vegetables are considered as the window to the world. It shows people what is available in the world rather than to focus on local production. Origin of the produce will become less important compared to quality, fresh supply, growing standards and the ability to trace back the produce to the level of the producer. Supermarkets, in other words, will stress the quality of the produce irrespective of where it is grown.

The new marketing strategy will be a pull strategy and no longer a push strategy. If growers want to sell at a satisfying price, they must organize themselves according to the principles of the pull strategy:

- To offer a broader assortment of apples and pears over a 12-month period. Apples and pears are characterized by a range of varieties distinctive in ripening time, color, taste and shelf life. The consumer can be surprised more easily than with other fruit species like bananas, grapes, kiwi, oranges, etc., which always look the same.
- Producers should not try to grow this variation in one area but combine high quality product for the best areas for the different seasons. This means combined offers of best grown varieties (yellow, red, green and bi-colored apples), even strategic alliances between the northern and southern hemisphere.

- By this strategy, apples will not compete with apples but with other fruits or with other alternative products. The basic principle should be a guaranteed quality. This quality is not only a nicely colored apple, but also a perfect eating quality, e.g., taste and shelf life. Unlike other fruits grown in limited areas, apples are grown in many more areas. The idea of harvesting them for long storage and for price speculation is completely wrong. Unlike bananas, which have to be harvested green and without a taste in order to reach the supermarket, apples can be harvested and supplied more directly at optimum quality if we accept the idea of dividing markets and seasons with other groups of growers.
- By offering a complete selection of varieties over a long period of time, we cannot only surprise the consumer, we also provide a perfect freedom of choice. Indeed, if we offer the portfolio of varieties at a unique price, the consumer has the right to combine different varieties. This perfect freedom of choice limits promotion and provides a feedback on the varieties preferred.
- This pull strategy limits promotional input; the product will promote itself. Through its variation, our produce can surprise the consumer more than other fruits like bananas, kiwi, etc. Strategic in this concept is the high quality standard based on organoleptic quality and guaranteed shelf life.
- To assure a high standard in quality, we should develop a charter for growing, storage time according to ripening and day fresh delivery.

WHY INNOVATION?

Since the apple industry has not put forward an answer to the changes in the market, it did not receive the added value needed to invest for better market performance.

Table 1. The sector structure of the apple industry.

Sector	Turnover (US \$)	Feature
Breeder	3.5 million	Public sector
Tree-nursery	130 million	Small entities
Apple growers	3.5 billion	Very expertise in growing but overcapitalized
Cooperative/Auctions	3.8 billion	Cooperative structure and culture
Supermarkets	7 billion	Best organized partner in the chain. It dominates in the buyers' market.

Breeding

Most of the breeding in deciduous fruit is short of financial input. It is moreover a long-term investment, driven by unclear goals. It is inefficient. Breeders inherit material from crosses they did not make themselves. After years of evaluation, they make new crosses which they transfer to their successor for an ongoing evaluation. Most of the breeding initiatives are publicly supported. The industry has never considered breeding as a long-term investment to solve crucial problems on a scientific basis. Furthermore, the results in Europe and elsewhere are very poorly protected: in Europe, farmers' privilege, and in U.S., patents on clonal variations.

The Nursery

Nurseries are small, family-operated entities. Their role should be limited to the supply of trees in a desired quality, true to type and guaranteed to be free from diseases. In reality, the nursery, at least in Europe, is an active designer and promoter of new planting systems and clonal selections. This is very strange since the nurseries are not supposed to have the market information on demands and price structures. It is responsible for royalty collection but there is no interest in seeing that these returns are or will be reinvested in further research. Today more public breeding research is sponsored by breeding clubs in which the industry is represented by nurseries.

The Fruitgrower

Generally fruit farms are small family operations. They have very low margins and are large, capital-involved operations because the grower is at the same time a broker/sales person. Since he did invest in private controlled atmosphere (CA) storage as well as in grading/packing machinery, he can and will decide on sales. He follows a very defensive strategy toward new challenges in the future such as reduced chemical input and increased service level in the market.

The Cooperatives

Cooperatives have evolved a new policy from market organization to an active market player. They are introducing private labels. They promote what growers have been producing. They have no influence on new plantings. They treat all growers equally. They are supply driven by their board of growers. At cooperatives' level, the product becomes anonymous.

Supermarkets

Supermarkets control more and more fruit sales. Their market share is still growing. They want to attract the consumer by offering fruits and vegetables as a window to the world. They really determine the price structure.

THE NEW OUTLOOK FOR APPLES IN EUROPE

Taking the European market for apples as an entry point, attractive features of the target market are: 1) market size (over 7 billion US\$ at consumer prices), 2) the health image of the product and 3) the significant scope for product innovation. Consumers and supermarket chains are dissatisfied with product quality and diversity. There is a demand for improvements in taste, appearance, quality control, packaging and product traceability.

Mission

Biofru is a start-up company with a mission to 1) initiate commercial innovation, 2) develop new and biotechnologically improved varieties of fruit (primarily apple) and 3) implement a new "total chain management" concept to produce the products and bring them to the market. This mission needs to be accomplished in three phases: commercial innovation, product innovation and technological innovation.

Commercial innovation. Biofru will enter into long-term contracts with supermarket chains which dominate the fruit market in Europe and will derive added value for its unique approach to 1) guarantee quality, 2) offer unique (proprietary) products and 3) manage the stock levels of the supermarkets. Biofru will develop its own identity when appropriate.

Test marketing in Belgium has convincingly demonstrated that 1) supermarkets are willing to pay a higher price for a high quality differentiated product, 2) such products can be sold to the consumer at a higher price while still increasing sales volume and 3) supermarkets are willing to make long-term price arrangements in return for consistent supply and reduced stock.

N. V. Jo Nicolai started a test marketing project on apples and pears with the Belgian supermarket chain Delhaize-Le Lion. The concept was discussed in March 1997 and started by the first week of September 1997.

The basic principles were set forward as follows:

- A completely demand-oriented sales policy.
- An availability of different varieties according to season.
- A delivery just in sequence (in response to sales).
- Unique and stable prices based on product value, production costs, commercial and sales costs.
- This unique price for different varieties allows the perfect choice between varieties.

- The consumer has the right to express his preference; he can even combine different varieties for the same price/kg.
- A bulk presentation of fruits in consistent quality supply.
- A daily delivery just in sequence with the consumers' preference which reduces stock on all levels of the market chain.
- This principle reduces the problem of poor shelf life. It moreover creates new market for highly valuable products in terms of optimal taste.

Added on to the concept were:

- Weekly information provided to the fruit-responsible persons in the different shops.
- Varieties available.
- Varieties no longer available.
- Statistical comparisons between all the shops in terms of volume sold, quantity sold per variety.
- Training on knowledge of varieties of the responsible persons at the shops.
- Training and information to the consumer about varieties and specific uses of the different varieties.

The results were phenomenal:

- Increased sales.
- Increased frequency in shopping due to consistent delivery of day fresh products.

Biofru's goal is to develop this strategy initially with existing varieties. Therefore, Biofru's operations will be conducted through the establishment of a system of "certified growers." Under this system, growers will have to adhere to a charter of quality standards (product selection), growing practices and delivery standards (packaging, delivery just in sequence). The company will work only with "certified growers" and thus manage the production side of the chain.

The selection of certified growers will not be limited to certain areas. Since the market scope is a variation of varieties over 12 months a year, these growers will be selected from strategic areas inside and outside Europe.

The product itself, its quality related to a micro-climate and its availability at the highest quality during a particular season of the year will determine the selection of the growing areas. To become a certified grower, he must be prepared to produce and market according to a specified charter.

Product innovation. Until now, innovation in the fruit sector has been hampered by the fragmented structure of this market. No single player currently has a strategy that covers the entire produce chain.

Apple breeding is largely done by public institutes. The germplasm is poorly protected and insufficiently remunerated. Time lines in fruit breeding are particularly long. Protection of research results in the fruit business is traditionally a weak point. Public varieties are important and the farmer's privilege permits him to multiply the trees for his own use. This erodes the value of genetically unique trees.

Nursery production of apple trees remains a rather small, low-margin business.

Fruit is grown by a large number of individual farmers; these are capital intensive businesses which carry a high production and market risk.

Selling auctions are an important factor in the commercialization. These are usually cooperative structures emphasizing equal treatment of their numbers and taking a bulk approach with little scope for product differentiation. New demands such as product traceability cannot be met.

The strongest players in the chain are the supermarkets which are highly organized and make the market into a buyer's market.

THE BIOFRU-STRATEGY, "TOTAL CHAIN MANAGEMENT"

Biofru is confident it has identified an innovative strategy which allows it to turn the above-mentioned hurdles, characteristic of the sector, into opportunities and to bridge the gap between the first sector genetic improvement (breeding) and consumer demand.

R & D Strategy

Product innovation through conventional breeding. During the last 11 years, N. V. Jo Nicolai prescreened in collaboration of the University of Leuven about 21,000 new apple seedlings. Because of this new collaborative approach, the conventional breeding program now annually evaluates 7,000 new apple seedlings. Detailed information on all crossing combinations produced gives today a higher output for expected fruit characteristics of taste, shelf life, color. The selected seedlings have been reduced to about 120. We allow only 5 out of 7,000 seedlings to be selected

annually for further pomological screening. Biofru will select test orchards in the different areas in and outside Europe to determine the most suitable climate in which to grow each variety.

Biofru's mission is not to compete with existing varieties but to offer the industry a completely new portfolio of varieties as well as the region-related charter to grow the best quality. Biofru will offer the market a portfolio of varieties covering a wide range of tastes and colors but present them in a consistent quality. Its mission is open for all new germplasm.

Product innovation through technological innovation. One of the certainties in deciduous fruit growing is the necessity of reducing the use of pesticides. In Europe, governments and supermarket chains, pushed by consumer organizations, will limit the use of pesticides earlier than we believe.

In terms of high capital risks at the producer level, regular crops of quality fruits are a necessity. A further quality improvement after harvest is a necessity.

Biofru's R & D strategy is to build exclusive relationships with top technology providers rather than reinventing the wheel through in-house basic research. Most technology companies focus on large field crops and do not themselves implement their technology in fruit. Biofru's focus is on the implementation of the technology in fruit. Biofru alliances give the company exclusive access to one of the world's largest biotechnology portfolios.

It is Biofru's aim to expand its in-licensing of new technology. The combined strategy of new technology with the new marketing strategy should represent benefits to all parties.

IPR (Intellectual Property Rights) Strategy

Protection of IPR will be at the heart of Biofru's business. New approaches of marketing seeds incorporating patented inventions (e.g., cotton and corn in the U.S.) provide attractive role models on how to effectively protect this value of research results in agriculture/horticulture. Biofru will fully exploit the opportunities for stronger protection in case of products containing patents of biotechnological inventions. Even for the introduction of new varieties based on conventional breeding, Biofru will be able to better protect the value of its germplasm on basis of its total chain management strategy. Biofru will also use protected brand names in its commercialization strategy when appropriate.

CONCLUSIONS

Taking the European market for apples as an entry point, attractive features of that market are market size (over 7 billion US\$ at consumer prices), the health image of the product and the significant scope for product innovation. Consumer and supermarket chains, however, are dissatisfied with the product quality and diversity. There is a demand for improvement in taste, appearance, quality control, packaging and product traceability. Until now, innovation in the fruit sector has been hampered by the fragmented structure of the market. No single player currently has a strategy that covers the entire product chain.

From experience with the industry, I decided to create Biofru as a start-up company with a mission to 1) develop new and biotechnology improved varieties of fruit (primarily apples) and 2) implement a new "total chain management" concept to produce the company's products and bring them to the market.

Through an active licensing effort, Biofru will organize rights to technologies that address additional targets relevant to the consumer and the grower.