

Collaborating to Increase the Profitability of Ontario Apple Producers



“Competitiveness used to rest on transforming one product into another. Now it rests on using the information that comes from that transformation process to continually improve the processes used to create value.” (Porter & Millar, 1985)

Ontario’s apple industry competes in a global industry composed of fierce and increasingly capable competitors.

Focusing primarily on cost cutting and productivity is unlikely to produce the long-term results achieved by implementing only those processes necessary for creating value from the perspectives of customers and consumers. The benefits of taking the “market driven” approach to business — where the entire value chain works collaboratively to continually increase the effectiveness and efficiency with which it creates value for consumers — include loyal repeat consumers, stronger business relationships, as well as higher levels of innovation, reduced costs, and greater profitability.

In conjunction with Norfolk Fruit Growers’ Association (NFGA), the Value Chain Management Centre undertook a project to identify opportunities to capture greater value from the production, grading, packing, marketing, and retailing of Ontario apples. The resulting insights are enabling NFGA to help Ontario apple growers increase their long-term competitiveness and profitability, and to work with retailers to reposition Ontario apples in the marketplace.

The views expressed in this report are the views of the Value Chain Management Centre and Norfolk Fruit Growers’ Association, and do not necessarily reflect those of Agriculture and Agri-Food Canada.

Investment in this project has been provided by Agriculture and Agri-Food Canada through the Canadian Agricultural Adaptation Program (CAAP). In Ontario, this program is delivered by the Agricultural Adaptation Council.



Agriculture and
Agri-Food Canada

Agriculture et
Agroalimentaire Canada

In particular, the research sought to identify

1. How NFGA could more effectively use the information that it already possesses to make timely daily management decisions and continually improve performance along the entire value chain; and
2. Opportunities to increase the value and price paid for Ontario grown apples by increasing their uniformity and better aligning practices occurring in the orchard and in the packing shed with market demands.

The activities undertaken to achieve these objectives were the following:

1. Map and measure the current state value chain to determine how grower, processor, and retailer needs are aligned with consumer needs, then identify the appropriate processes and interventions required to establish a chain length continual improvement program;
2. Map and measure the current state value chain to identify product, information, and financial flows;
3. Identify costs of process inefficiency or poor quality, then prioritize and plan improvement activities that can increase revenue, reduce costs, and enhance profitability; and
4. Determine an approach to data collection and analysis that will enable the implementation of a chain-length continual improvement program.

Headline Findings

Conclusions drawn from the research include the following:

- Strong trusting relationships exist between growers, NFGA, and retailers. These relationships had, however, not been used strategically to enable the development of innovative processes and thoroughly align management decisions with market demands.
- Significant unrealized opportunities exist for NFGA and apple producers to increase their competitiveness and profitability. The greatest opportunities for all producers to increase profitability are from enhancing revenue by improving the effectiveness of their orchard management techniques. This does not discount the importance of reducing costs wherever possible; it merely reflects that placing undue focus on being efficient is wrong.
- The majority of factors relating to the profitable production of apples occur in the orchard. Packers cannot turn a poor quality apple into a marketing success, partly because consumers' support for local does not extend to purchasing inferior apples, the quality of which does not match those sourced from competing jurisdictions.
- None of the opportunities identified during the research require capital investment. They rely instead on utilizing the information and traceability systems that exist more effectively, to enable more informed management decisions in producers' orchards and in NFGA's facilities.

Research Methodology

The research encompassed three rounds of confidential interviews with senior NFGA management, growers supplying apples to NFGA (they included members and non-members), and a retailer to whom NFGA supplies apples; a confidential online survey completed by twelve growers; a grower meeting held at NFGA's offices; three plant walk-throughs; and the analysis of data provided by NFGA and growers who supply apples to NFGA. Discussions also occurred with experts from the wider industry, within and outside of Canada.

The analysis of quantitative and qualitative data occurred throughout the project, with each iteration of the research providing increasingly detailed insights and outcomes. This enabled the researchers to identify and quantify the strength of relationships between factors associated with the production, grading, packing, and marketing of apples to identify cause and effects. This, in turn, enabled the researchers to propose interventions that would enable growers, NFGA, or other businesses to reduce costs or increase revenue.

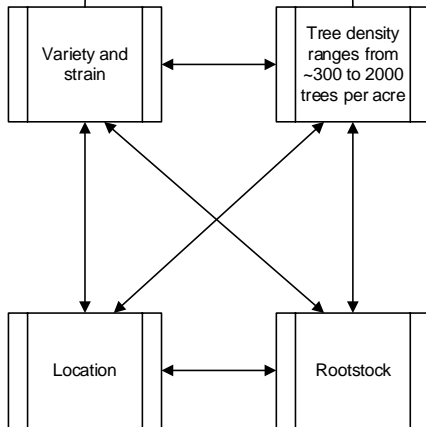
Value Chain Map

The research enabled the development of a value chain process map. Presented below in Figure 1, the map details where opportunities exist to improve performance, and why. It also identifies differences in growers' performance and why their performance differs. The map shows that the majority of opportunities relate to the production of apples' and growers' adopting progressive orchard management techniques. The collection and sharing of information that can be acted upon by growers is a critical role that NFGA will play in enabling this transition to occur. To a great extent, NFGA is essentially a slave to what has been produced and has limited opportunities to improve performance on its own.

These issues result in neither producers nor NFGA fully benefiting from the production, grading, packing, and marketing of apples. Many of the factors that impact growers' revenue also impact NFGA's efficiency through unnecessarily increasing grading and packing costs. This tightening of the book ends negatively impacts apple producers' profitability compared to what is possible. The per acre revenue generating opportunities, which many producers could secure from improving their orchard management practices in relation to market demands, are at least four times the financial opportunities that can be acquired through reducing costs.

- Traditional plantings produce 700-800 bushels per acre of good quality apples or 1,200-1,400 of low quality apples.
- Optimal target considered 1,000 - 1,200 bushels of good quality apples per acre

- Have greatest impact on the value of production and market opportunities
- ON not growing sufficient volume of varieties most desired by retailers
- Leading growers base decisions on market signals
- Some packers have higher % of high value varieties than NFGA's supply base



- Apples grow best on loam soils
- Location determines most appropriate combination of variety, strain, rootstock and tree density
- Choice of variety, strain and rootstock often based on assumption, preference or convenience

- Rootstock determines vigour and the most appropriate husbandry techniques

Elements of orchard husbandry:

- Significant variation in the processes growers use to produce apples
- Little formal benchmarking or sharing of information between growers
- Leading growers base husbandry decisions on quantitative measurable data
- Specific processes required to produce high quality and value fruit differ by orchard density, location, variety, strain, rootstock, etc.

Strategy vs. husbandry

- Most growers not adopted strategic approach to how plan and manage orchard
- Strategic practices determine producers' long-term assets and options
- Husbandry practices have greater impact on growers' profitability and sustainability
- Canopy management outcome of effective strategic planning and husbandry. Critical to enabling growers to maximize profitability

Input costs

- Highest costs are labour and chemicals
- Leading growers focus on ensuring the cost effectiveness of their operations
- Other growers seek to minimize costs *per se*

Revenue

- Greatest financial opportunities are increasing revenue through effective orchard husbandry
- Revenue determined by balancing quality and volume regardless of variety, location, market
- Leading growers focus on maximizing revenue through ensuring the most appropriate management practices

Data and facts vs. opinion and assumption

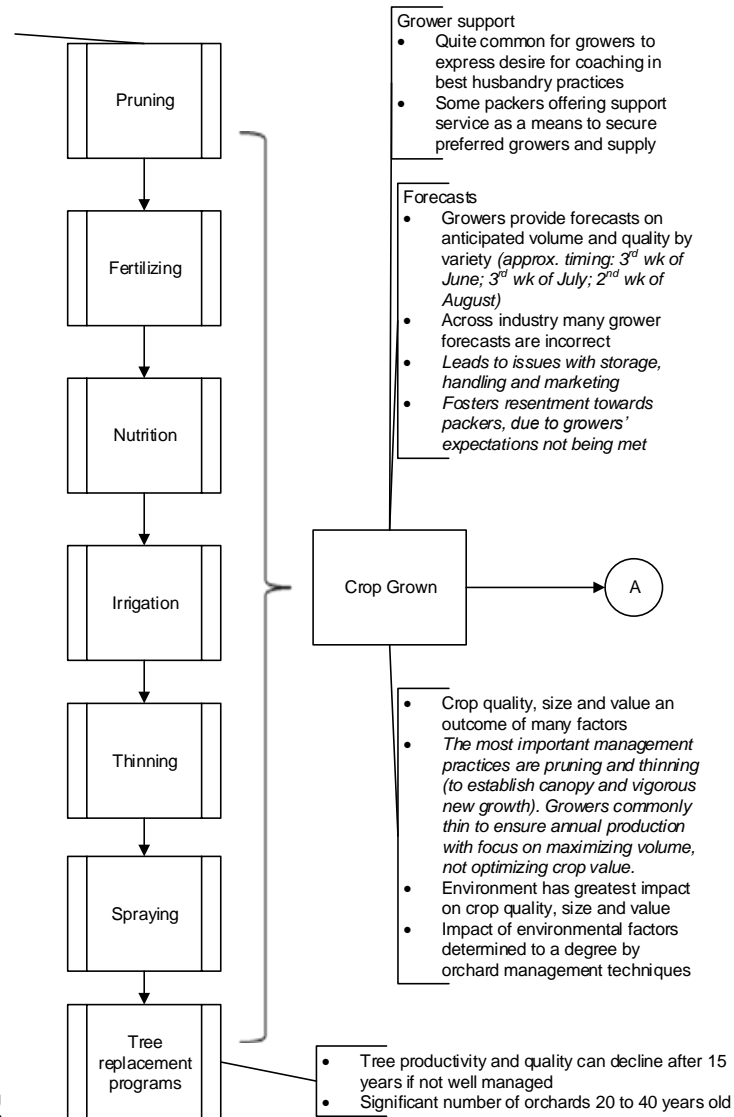
- Leading growers monitor and track COP quantitatively, using data supplied by Streamline to make informed decisions
- The value of using Streamline data proven by a grower, having used it, turning a loss-making orchard into one of their most profitable

Attitude towards others

- Many growers' behaviour reflects a mindset of blame versus accepting accountability
- Leading growers seek solutions by learning from packers and customers; see themselves as accountable for their own success or failure
- Leading growers proactively share information with others if it will enable them to make more informed management decisions

Grower / industry support

- ON growers unable to access same research and scientific support as regions of US
- This and economy of scale among the factors that translate into many smaller growers using less sophisticated management practices than might otherwise occur



Grower support

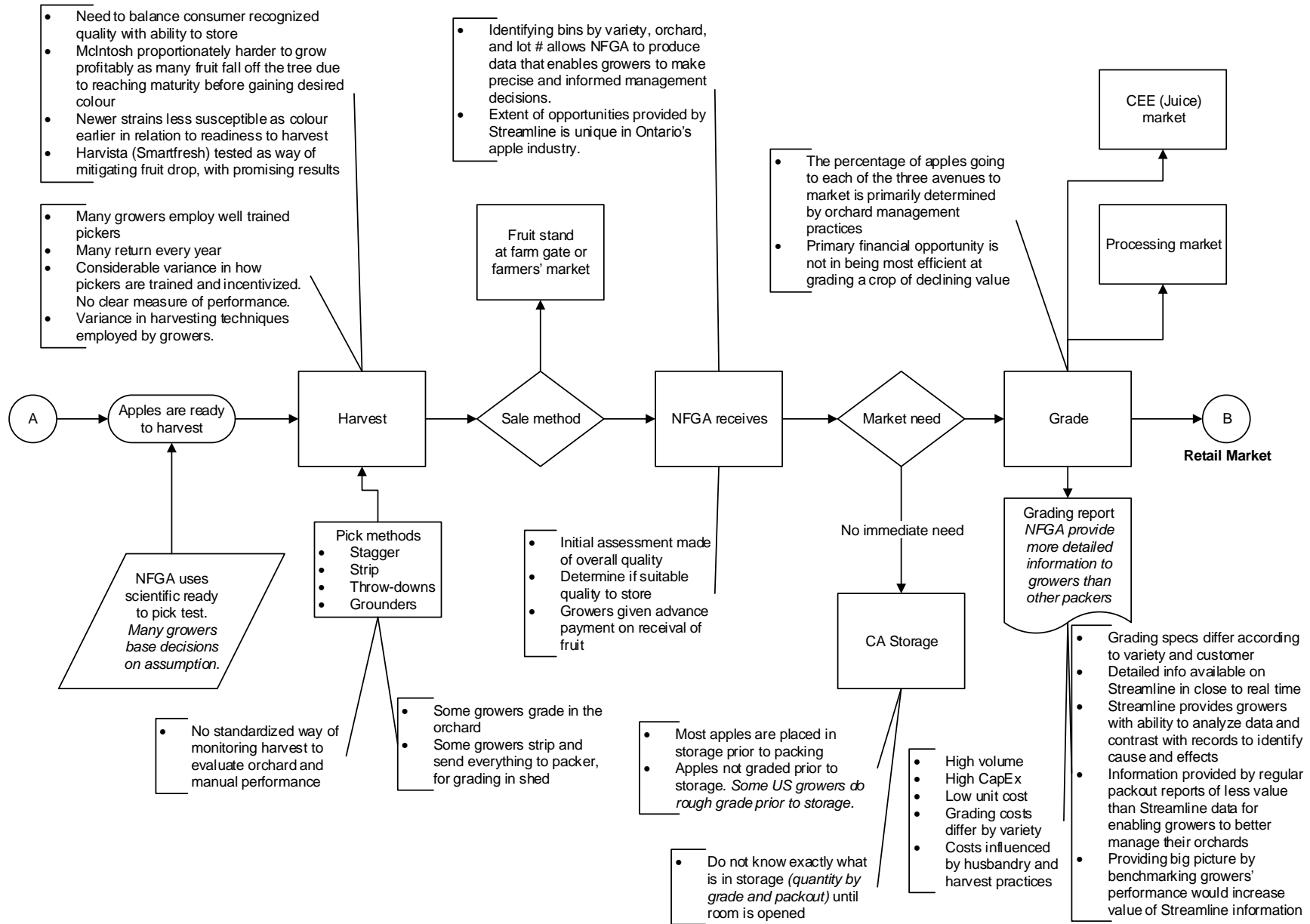
- Quite common for growers to express desire for coaching in best husbandry practices
- Some packers offering support service as a means to secure preferred growers and supply

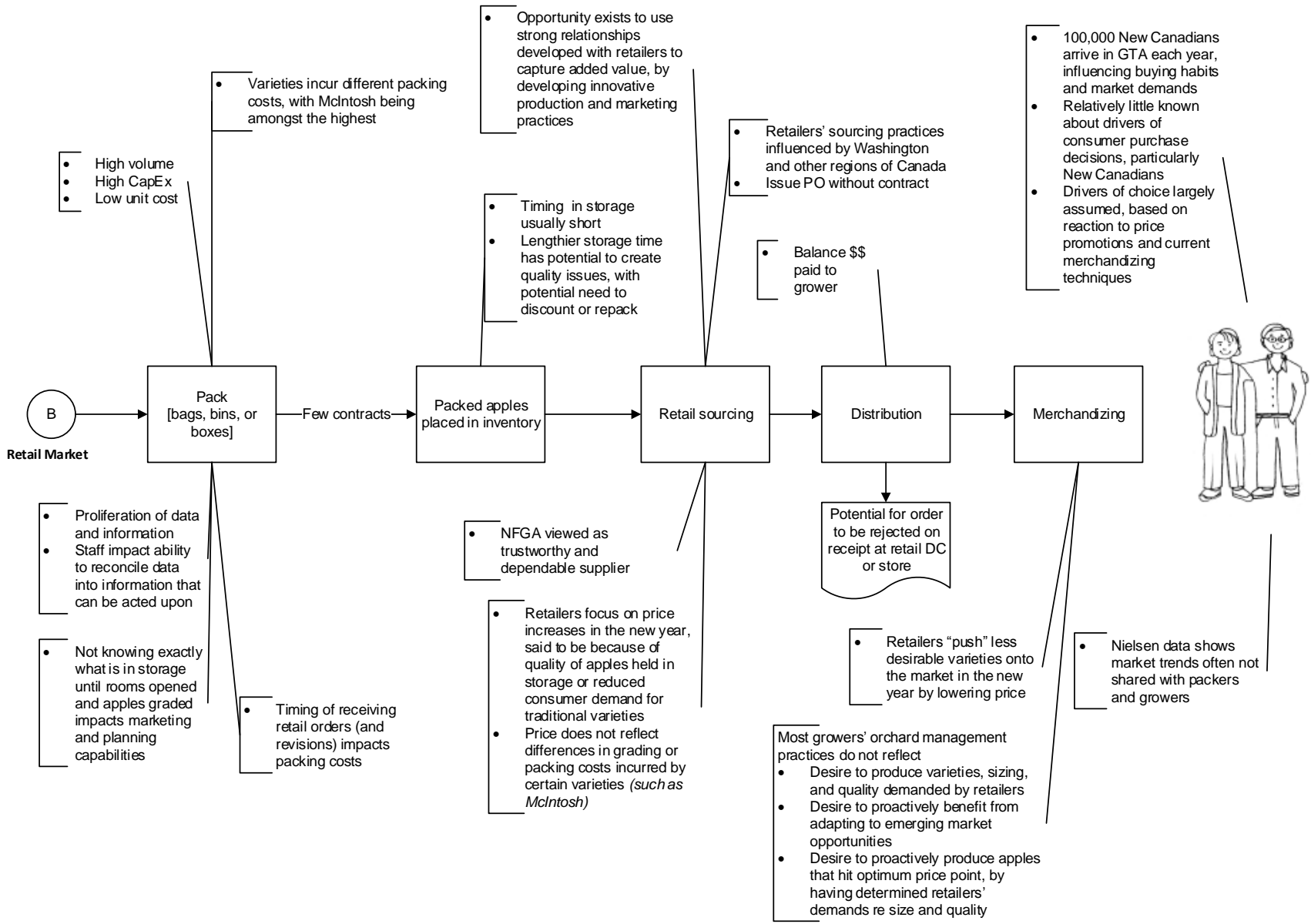
Forecasts

- Growers provide forecasts on anticipated volume and quality by variety (approx. timing: 3rd wk of June; 3rd wk of July; 2nd wk of August)
- Across industry many grower forecasts are incorrect
- Leads to issues with storage, handling and marketing
- Fosters resentment towards packers, due to growers' expectations not being met

- Crop quality, size and value an outcome of many factors
- *The most important management practices are pruning and thinning (to establish canopy and vigorous new growth). Growers commonly thin to ensure annual production with focus on maximizing volume, not optimizing crop value.*
- Environment has greatest impact on crop quality, size and value
- Impact of environmental factors determined to a degree by orchard management techniques

- Tree productivity and quality can decline after 15 years if not well managed
- Significant number of orchards 20 to 40 years old





Orchard Management

Information provided by a respected outside resource regarding precision growing techniques illustrated the extent of opportunities that exist for growers to improve the financial performance of their orchards. The high average revenue among NFGA growers for Empire apples is ~\$4,700 per acre. Research in New York State purports that the average achievable revenue for Empire is \$8,000 per acre. This constitutes a minimum difference in revenue of \$3,300 per acre. Closing this gap relies on growers' increasing the effectiveness of their orchard management techniques.

Growers' reputation for producing consistently high quality fruit of the size, quality, and colour demanded by retailers, in the volumes required to meet market demands, also impacts revenue. Differences in growers' capabilities and reputation result in a 100+% price difference existing any day between cartons of apples graded Extra Fancy, for example \$25 versus \$10 (O'Rourke, 2012)¹.

Listed below are what Robinson (2013)² and Farrow (2013)³ state as the thirteen orchard practices that determine apple producers' revenue, cost structures, and therefore profitability. Variety, strain, and rootstock selection are listed last, because maximizing an orchard's genetic base rests upon the effectiveness of the first ten factors. While there are discrete differences in the effectiveness of orchard management practices of producers supplying NFGA, with distinct leaders existing among the group, improvement opportunities exist across NFGA's entire supply base.

Critical Orchard Management Practices

1. Crop-load management — pruning and thinning
2. Nutrient management
3. Water management
4. Weed management
5. Orchard design — and the possibility of further mechanization
6. Labour management
7. Risk management
8. Disease management
9. Insect management
10. Harvest management
11. Variety selection
12. Strain selection
13. Rootstock selection

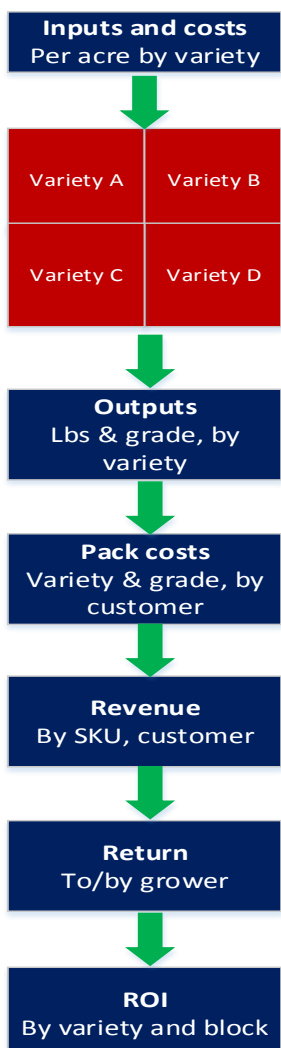
¹ Rourke, A.D., (2012). Personal Communication; Belrose Inc.; Spokane, Washington, USA

²Lehnert, R. (2013). Optimizing production; Good Fruit Grower; <http://www.goodfruit.com/Good-Fruit-Grower/May-1st-2013/Optimizing-production/>

³ Farrow, R., (2013). Personal Communication; Lamont Fruit Farms: Waterport, New York

Continual Improvement

Presented in Figure 2 is an analytical approach that was developed in conjunction with NFGA to enable producers and NFGA to increase their profitability, by making more informed management decisions. It



begins and ends in the orchard, and encompasses the entire value chain. In doing so, it would enable cause and effects associated with the growing, harvesting, grading, packing, and marketing of apples to be identified and benchmarked from a management and financial perspective. It would also enable the development and implementation of a continual improvement program that can be implemented at the level of individual blocks, varieties, and growers.

Figure 2: Analytical approach for fostering a continual improvement program

The concept behind the proposed approach is that it will guide growers through the process of continually improving their management practices and profitability wherever possible, by identifying with precision:

- **Cause and effect**, enabling the effective management of determinants of success;
- **Market opportunities**, ranked according to their commercial value and difficulty to achieve;
- **Best practices**, through identifying differences between growers' management practices and associated COP, revenues, and profitability (\$);
- **Grading/packing costs**, where the greatest opportunities lie for NFGA to reduce costs and how; and
- **Profitability**, where the greatest opportunities lie for individual growers to increase their profitability, and how.

Implementing this approach to gathering and analyzing data will enable NFGA to assist growers strengthen their competitiveness by providing them with the guidance and support required to profit from adopting low risk incremental improvements to how they manage their orchard in relation to target market demands.

Proof of the value of the Streamline data is evidenced by an incident where a grower used it to guide management decisions and consequently turned a loss-making orchard into one of his most profitable orchards.

Examples of the insights that can be gathered from analyzing data from this perspective are presented below. They are taken from analyzing data provided by members of NFGA who are currently using Streamline. The analytical tools required to produce the insights presented below are available for as little as \$200.

Each boxplot chart contains box and whisker plots. Each combination of boxes and whiskers shows the full range of data being measured, minimum through to maximum, divided into four quartiles. The whiskers show the spread of the upper and lower quartiles; the boxes comprise the second and third quartiles. The line that lies within the boxes is the median. In certain charts, such as Figure 3, the boxplot of revenue by pound and variety also shows outliers. Outliers can play a valuable role in cause and effect investigations by helping to illustrate relationships between input-process-outputs.

Figure 3 below shows the range of revenues per pound received by the growers for four varieties of apples, along with Mac Peeler. The highest prices were received for Gala. The narrowest spread of prices was received for McIntosh. It also shows that the growers received higher prices for some McIntosh apples than the vast majority of what was produced. Further analysis, including a cause and effect investigation, could lead to the growers' having the ability to consistently produce McIntosh of this value. The same type of analysis might also find that the greatest short-medium term opportunities for these growers lie in reducing the lower end of the Gala prices, say to a minimum price of \$0.20/lb.

Figure 3: Revenue per pound, by variety

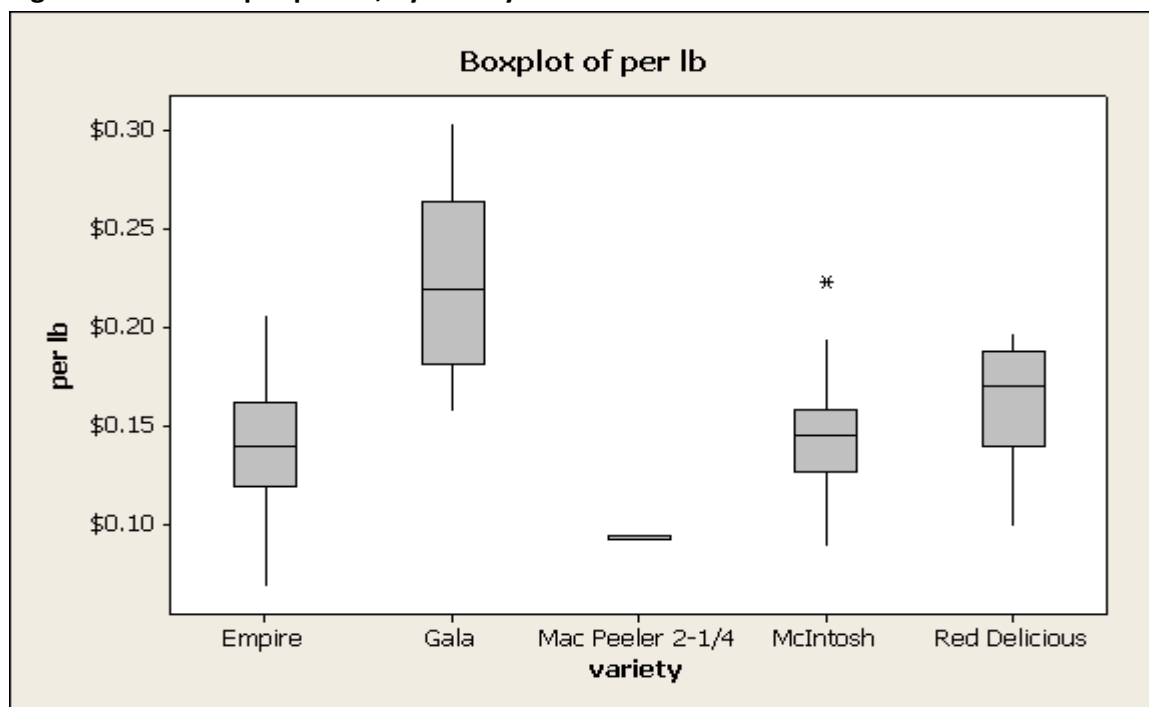


Figure 4 below shows that farm 3 has the lowest return per acre. This is because it is a new planting. Farm 8 has the highest return per acre, but it also has the greatest variation and therefore might not be depended upon to provide consistent revenues. The challenge is for NFGA and that grower to identify and address the causes of revenue variation, resulting in higher and more consistent revenues. Farm 5 does not have the highest revenues per acre, though there is the least variation and therefore the most predictable returns.

Figure 4: Returns by farm

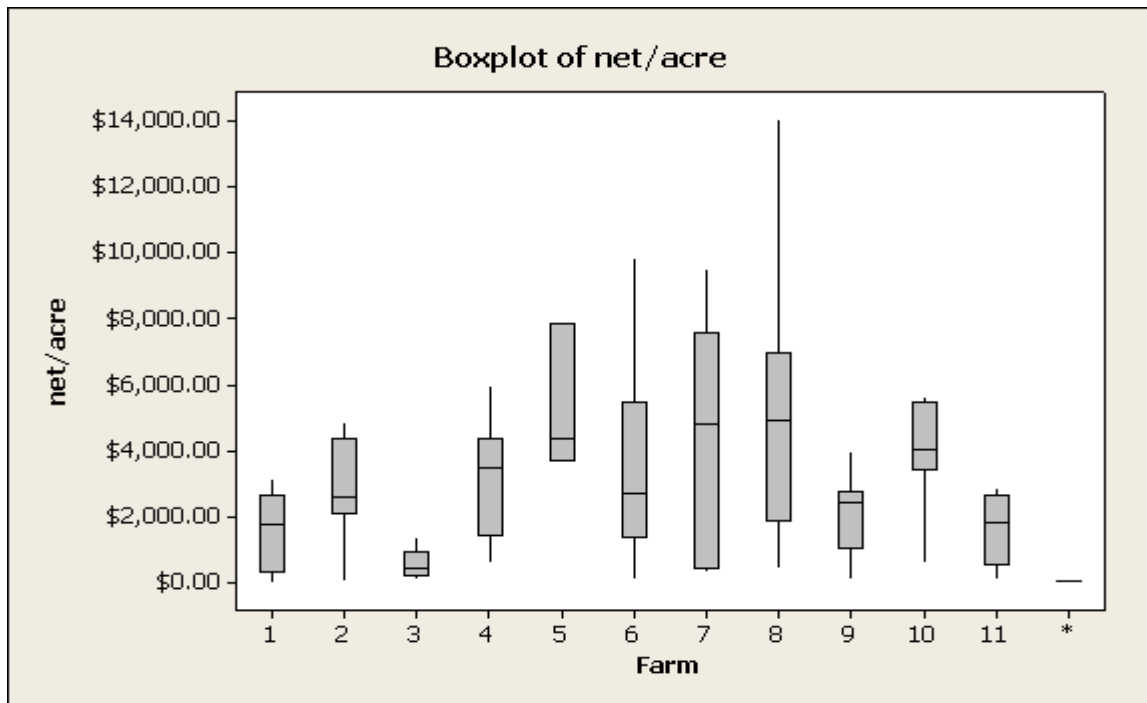
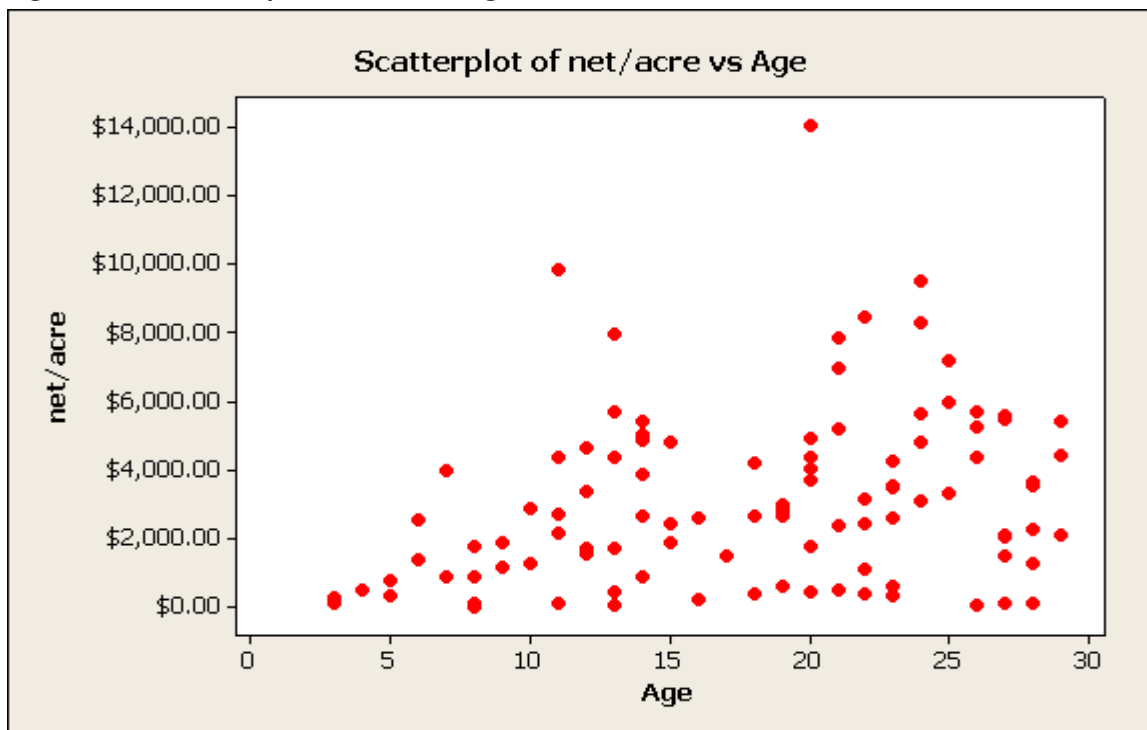


Figure 5 considers the causal relationship between tree age as a predictor of net returns per acre. While the range of returns by tree age varies significantly, the wedge shape of the dots shows that revenues tend to increase as trees age. It also shows a positive outlier in trees aged ~20 years.

Figure 5: Relationship between tree age and returns



Recommendations

Presented in the table below are recommendations for improving the profitability and long-term competitiveness of NFGA and Ontario apple growers. These recommendations pertain to the entire value chain, particularly in relation to implementing interventions that will strengthen relationships between NFGA and its grower base, and support growers in enhancing their management capabilities to increase profitability.

Item	Action	Degree of difficulty	Cost to implement	Expected benefits
1	Set all growers up onto the grower portal this winter. Ensure growers report by farm, variety and significant block	Low	Low	High
2	Establish a revenue and cost benchmarking program between members of NFGA and with other external organizations	Low	Low	High
3	Establish a theoretical and target \$/acre by variety/density/age of tree	Medium	Low	High
4	Establish what retailers will pay a premium for by variety and attribute, and anticipated demand	Medium	Low	High
5	Determine to what extent NFGA members can meet the demand for premium priced fruit	Medium	Low	High
6	Establish a common template for recording, tracking and managing costs	Medium	Low	Medium
7	Establish a continuous improvement program across the membership to attain benchmark performance	Medium	Medium	High
8	Conduct analytics on the effect of input variables on yield and returns	Medium	Low	High
9	Consider using lean enterprise principles for labour intensive tasks — as well use active supervision and daily management	Medium	Low	High

November 2013