

Can Greenbelt Microgreens Expand its Model?

A Discussion on the Future of Microgreens

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Abstract

Microgreens are considered as an emerging superfood, which are young seedlings of vegetables and herbs, produced in seven to fourteen days. Known as “vegetable confetti”, they gained popularity in upscale restaurants. But microgreens’ nutritional value is only starting to be identified through scientific research. Microgreens are nutrient-dense and make a healthy addition to salads, sandwiches, dishes, and other portable food solutions. According to some recent studies, vitamin and mineral levels can exceed full grown vegetables by more than forty times, requiring less water and energy throughout the process. This case study is about a company called Greenbelt Microgreens, based in Hamilton, Canada. Greenbelt Microgreens grows, harvests and distributes certified organic microgreens. The aim of the case study is to better understand the model and how it could be expanded beyond the region by capitalizing on a growing trend of local, organically grown food products. The case presents how microgreens are positioned in the marketplace. It also describes the company itself, its challenges and a discussion on specific, strategic elements to consider.

1. Introduction

An increasing number of studies point to the growing demand for locally sourced, organic vegetables. Various types of young vegetables, such as sprouts, microgreens and baby greens, are becoming very popular due to their higher nutritional value than their mature plants or seeds. Vegetables and fruits, recognized sources for vitamins and minerals, have fluctuating prices. In addition to unpredictable prices, seasonality has a significant impact on the quality of products being consumed all year around. The Canadian market is highly vulnerable to currency fluctuations as it imports most of its fruits and vegetables. In organics, more than 80% of what is consumed in the country is imported (Green, 2014; Charlebois and Haratifar, 2015).

A Canadian-based company is attempting to reverse that trend and offer a locally grown, organic superfood of sort called microgreens. Microgreens have largely been either ignored, or misunderstood by most. Microgreens are known in the industry as ‘vegetable confetti’ (Buehler and Junge, 2016). Although relatively unknown, Greenbelt Microgreens (GM) believe this new food category could disrupt how we consume vegetables and move beyond its function in culinary arts. This case study is about a company’s attempt to develop a model to expand the production of microgreens across North America. The case first starts by describing what microgreens are, followed by a description of Greenbelt Microgreens. The case concludes by presenting findings and future research possibilities.

2. Microgreens

Microgreens are new in the market and relatively unknown. They are young and tender cotyledonary leafy greens that are found in a pleasing palette of colours, textures, and flavours (Pfeiffer, Silva and Colquhoun, 2015; Weber, 2017). They are gaining popularity as a new culinary ingredient and are used to enhance salads or as edible garnishes to embellish a wide variety of other dishes. Due to higher price points at retail, microgreens are considered a premium product (Baenas et al., 2017). The appeal is purely based on bioactives and the environmental value behind its production. The consumption of microgreens seems to increase owing to higher concentrations of bioactive components such as vitamins, minerals, and antioxidants than mature greens, which are important for human health (Agricultural Research, 2017).

Microgreens are often confused with sprouts. Sprouts are grown in water where there's much greater propensity for bacterial growth because of the closed loop system with water (Nesbitt, 2009; Buzalka, 2016). Fresh produce can sometimes be contaminated with harmful bacteria while in the field, during growing or harvesting, or during storage and handling. This is of concern with sprouts, not microgreens. Over the years, many Salmonella and E. coli infections have been linked to contaminated sprouts.

“When the romaine lettuce recall happened in December, our sales went up. The word is getting out that the product is safer.”

Christina Lee, Quality Manager

Microgreens, on the other hand, are grown in fertilized soil. They are usually harvested at the first true leaf stage of growth. They also belong to the group of “functional foods” and have advanced levels of bioactive compounds (Mir, Shah and Mir, 2017). Grown in a greenhouse with supplemental lighting and heating, microgreens can be produced throughout the year, which allows several production cycles to occur (Samuolienė et al., 2017).

Several studies in recent years have built a case for microgreens from an environmental and nutritional perspective. According to some studies, microgreens have larger quantities of vitamins and minerals than the vegetable itself. Extrapolation from experimental data presented in some studies suggest that microgreens would require less water than they do to grow a nutritionally equivalent amount of mature vegetable in the field (Durham, 2017).

Future demand for microgreens is unknown. They have been available on the market for about twenty years but have never been available for mainstream consumption. GM is working with the University of Guelph to measure the nutritional value of the crops.

3. Methodology

We chose an exploratory case study design to guide our investigation based on Yin's (1994) argument that case studies are the preferred strategy when 'how' or 'why' questions are being posed and when the focus is on a modern phenomenon within a real-life context. In our study research data was collected through multiple approaches. A semi-structured questionnaire was designed and adopted to collect primary data. The objective of the empirical segment is not to test the applicability of the existing approaches, but rather to study conceptual nuances related to the presented model.

A survey study focused on formal onsite interviews at GM's headquarters in Hamilton, Canada in January 2018. Comments were recorded comprehensively for supporting analysis. Respondents were interviewed separately and represented key informants in a variety of functional areas, including the President of GM. These individuals possessed sufficient experience and understanding of the organization's culture and strategic intents to be able to comment with authority on the young history of GM and its role in growing the microgreens market. The interview questions were largely designed to be open-ended in order to provide flexibility in interview discussions. The interviews provided information on the perceptions, application and experience of strategy in greenhouse production in organics microgreens. The collected data was arranged, analyzed and put into the subsequent application phase. A draft version of the paper was submitted for review to the organization for internal validity (Yin, 1994). This case study will aim to uncover best practices in expanding markets in greenhouse production.

4. Greenbelt Microgreens

GM, established in 2010, has been growing at an remarkable rate. The mission of Greenbelt Microgreens is to *"be the trusted brand for greenhouse grown, local, organic produce in North America"*. It is now Canada's largest organic grower of microgreens and likely the largest retail-focus microgreen processor in the world. GM is trying to achieve its goals by using special seed and fertilizer agreements with suppliers, and by utilising a soil mixture that allows for higher yields and fast production cycles (David, 2017). The mixture is not patented but it is a proprietary to GM.

Over the last few years, they have secured major accounts, like Whole Foods Canada (13 stores), Loblaw, Sobeys, Metro (120 stores) and Longos (33 stores). In 2012, they secured Toronto-based The Big Carrot, an account the company still has today. In 2013 and 2014, Rowe Farms and 100km Foods started to purchase from GM. Whole Foods Canada joined as an account which is described by Ian Adamson as a significant change for the company:

"We have been able to explore the notion of microgreens by relying on smaller accounts. Once we got our certifications, we got major accounts. Once you get a hold of Whole Foods, it is easier to get other accounts."

Ian Adamson, President, GM

In 2016 and 2017, they were able to secure major accounts, like Longos, Sobeys and JE Russell. Loblaw (Loblaw stores only) and Metro followed soon after. Sales increased by 117% in 2017 alone, surpassing \$5m for the first time. Projections by the company show that executives are aiming for more double-digit growth over the next few years. Profits, on the other hand, have grown six-fold in 2017 and are expected to continue to grow over the next few years. Leveraged by more efficient profits should be ten times those of 2016 in coming years.

GM's products are now available in over 400 stores within the Greater Toronto Area, and some parts of BC and Alberta. They have been able to set up displays in several stores to promote their products as well. The company's main strategy is about getting free public relation opportunities. The company's marketing budget equates to about 2% of total revenues.

Major crops include arugula, sunflower, pea shoots, wheat grass and broccoli. Arugula, the company's best-selling crop, represents about 10% of the company's revenue. The company grows about 15 different crops, but has also expanded its offering by making key mixes with different varieties. Mixes allows GM to get away from the "vegetable confetti" paradigm, and mixes tend to be more profitable. Mixes also allows GM to generate new opportunities through different products. The retail market is wide-open. The company has about 30 different SKUs. More details can be found in Appendix A. There is no plan to change or develop a new brand of products. A typical package can be found in Appendix B.

4.1 Woodhill Facility

The company's 3.5 acre soil-based facility on Woodhill Road in Hamilton seeds, grows and packages microgreen products ready for market. GM had a 1-acre facility in Gormley which closed in December 2017 and acquired the Woodhill facility to scale up. All operations moved to the state-of-the-art Woodhill facility. Beforehand, at the Gormley facility, the company was struggling. Some employees have stayed with the company and are now working at the Woodhill facility. One of them is Alice Ferris, Head Grower.

"We were running on zero budget, and maintaining our operations with a limited budget was challenging."

Alice Ferris, Head Grower, GM

The new 3-acre facility grows all year round and can market a product with a shelf-life longer than the production cycle. A significant challenge for the company is to maintain a cycle production that is highly-intensive. The average shelf-life, according to the company, is 13 days. Due to its propriety of growing and production, it can deliver a high-quality product to key customers in the Canada and in the U.S.

"The speed of this crop is keeping me up at night. We go through 52 cycles for certain crops, which is remarkable. Growing problems can compound so rapidly. The yields we are producing is impressive."

Alice Ferris, Head Gower, GM

GM also uses unique compostable trays in their facility (Sparks, 2017). Product quality and hiring are challenges at GM. The company has hired Syrian refugees, and temporary workers to make operations work. New equipment and automation is helping offset human capital pressures. Equipment failure is a major concern for GM. The facility is still under construction and the speed of the expansion is making GM operations vulnerable. And given that operations are highly centralized, one failure can be sizable. Since the facility will be fully automated, technical problems can affect many crops at once. The Woodhill facility is automated, and has been built, using unique materials rarely found in other greenhouses in North America. Pictures can be found in Appendix C.

“Climate change is the main reason we chose this roof, engineered in Germany. It was expensive, but it will take 10 cm hail balls.”

Ian Adamson, President GM.

GM’s facility recycles all of its water, as most greenhouses do, but the company has also incorporated other energy-saving features, including a glass that lets UV rays get through, made in Germany (Day, 2017). With more capital, the company experienced a mindset change. Capital is now available compared to when operations were at Gormley. But the company has no system to monitor how crops are being treated. GM does not have a system which allows operations to track what is going on throughout the greenhouse in real time. Currently, all the data is entered onto spreadsheets which typically takes longer to enter than to conduct the actual work in the greenhouse. Another concern is consistency. Calibrating soil lines has been difficult. Because of such a short production cycle, the soil mixture is critical, but it has been inconsistent at times. Improvements are still being made but GM believes it is about to reach a point where marginal improvement will almost be trivial, compared to a few years ago.

GM which is GAP (Good Agricultural Practices Certification) certified, is currently the only major supplier of microgreens in Canada. GM is also Organic certified as well by ECO-Cert, but it is not HACCP certified and currently has no plans to pursue other certifications (Charlebois and Giberson, 2010).

As mentioned before, within the last year, GM has experienced tremendous growth. Single packaged orders are non-existent. What is unique about GM’s operations is that it is a complete-closed cycle, from sending to packaging, producing a ready-to-market product.

“I’m comfortable with the growth we are experiencing. Keeps us on our toes.”

Christina Lee, Quality Manager

GM has secured key accounts in recent years, but the company has noticed differences in how customers deal with the product, how important it is to their stores and overall offering. Comments were made about drivers and corporate cultures.

“I have favourites with customers. When dealing with drivers, you get a better sense of how the company is.”

Christina Lee, Quality Manager

The company has relationships that allows it to monitor sales. Onboarding of new customers is an interesting process. Sales usually grow exponentially at the beginning but decrease soon after. Nonetheless, once sales have declined, they tend to increase slowly, over time. GM also has relationships in which it is more challenging to access market data (Tamilia and Charlebois, 2007).

4.2 Expansion

Even though the Woodhill facility is new, the company is already running out of space. Executives believe the GM is scalable across many regions. It now has a partner-grower in British Columbia (Maple Ridge) and in New York (Wessell Farms), both partnerships were established less than two years ago. It takes many months for partners to purchase the proper equipment, calibrate the appropriate soil solution and sell to market.

“We are in NY for about 2 months now (in production). The U.S. is a large market. The U.S. market is competitive, but not for microgreens. The market is highly immature.”

Ian Adamson, President, GM

They have plans to seek new partnerships but are waiting to see how current partnerships will play out. Finding the right grower-partners seems to be a challenge. The Woodhill facility is being developed as a model which can generate a \$4 million revenue per acre and 35 crop cycles per year. GM’s aim is to replicate this model elsewhere. In addition to British Columbia and New York, GM is currently negotiating agreements with top quality growers in California and Quebec. GM is attempting to target markets where organic and local foods are in high demand.

Terms of the contractual arrangement with partners are simple as it is essentially a licensee agreement. There is an existing 2-year relationship with Wessel Farms in New York State, which is located about 65 km away from New York City. GM is in the process of negotiating the license agreement. Wessel Farms has a 10-acre greenhouse farm strategically located close to a very large market. Profits are shared equally between the two parties. How information is shared between parties was not disclosed. Wessel Farms provides greenhouse, equipment, utilities, growing expertise and labour based on a flow-through basis. In return, GM provides all the soil, seed, fertilizer, compostable trays, boxes, labels, and marketing based on a flow-through basis. Given that it is a capital extensive operation, future capital expenditures are equally divided between GM and Wessels Farms. GM finances Wessel by lending the company the capital needed to support any expansion plans in New York State. The plan is to have Wessel Farms own equipment at the end of the term, giving GM the option to purchase.

GM’s knowledge has already received some recognition. In 2017, it received the Premier of

Ontario's award for innovations in Agri-Food Innovation Excellence. It also received an award for development of innovative harvesting technology resulting in labour costs savings of 80% per kg harvested. The optimal usage of the facility in Hamilton is believed to generate up to \$16m in sales with only 35 employees.

4.3 The GM Team

The President and Head of Operations for GM is Ian Adamson. He started his career in landscape architecture and has 20 years of experience as operator, grower, and owner of a greenhouse business. Adamson is the mind behind the proprietary design and development of the microgreen equipment used by GM. Royalty and exclusivity arrangements with equipment manufacturers have been developed by Adamson to support GM's growth. The soil mixture which allows for the longest shelf life in the industry was created by Adamson himself. Michael Curry has been involved with the business since April 2016, but has known Adamson for seven years before joining the company. He has fifteen years experience as a partner at InvestEco Capital working with emerging companies in the Agri-Food industry.

"This was the best opportunity I've seen in 15 years, looking at investments."

Michael Curry, VP, GM

Adamson believes Curry has been key to sizing the business correctly. Ian Ritchie is also a key business development manager for GM and has been involved with the business since 2016. Given that it is a relatively small team, many employees, as it is in smaller organizations, are being asked to be flexible and conduct work beyond the scope of their position. Maintenance seems to be one area where they try to help the company by providing some assistance on an ad hoc basis. An organizational chart of the company can be found in Appendix D.

5. Conceptual Framework

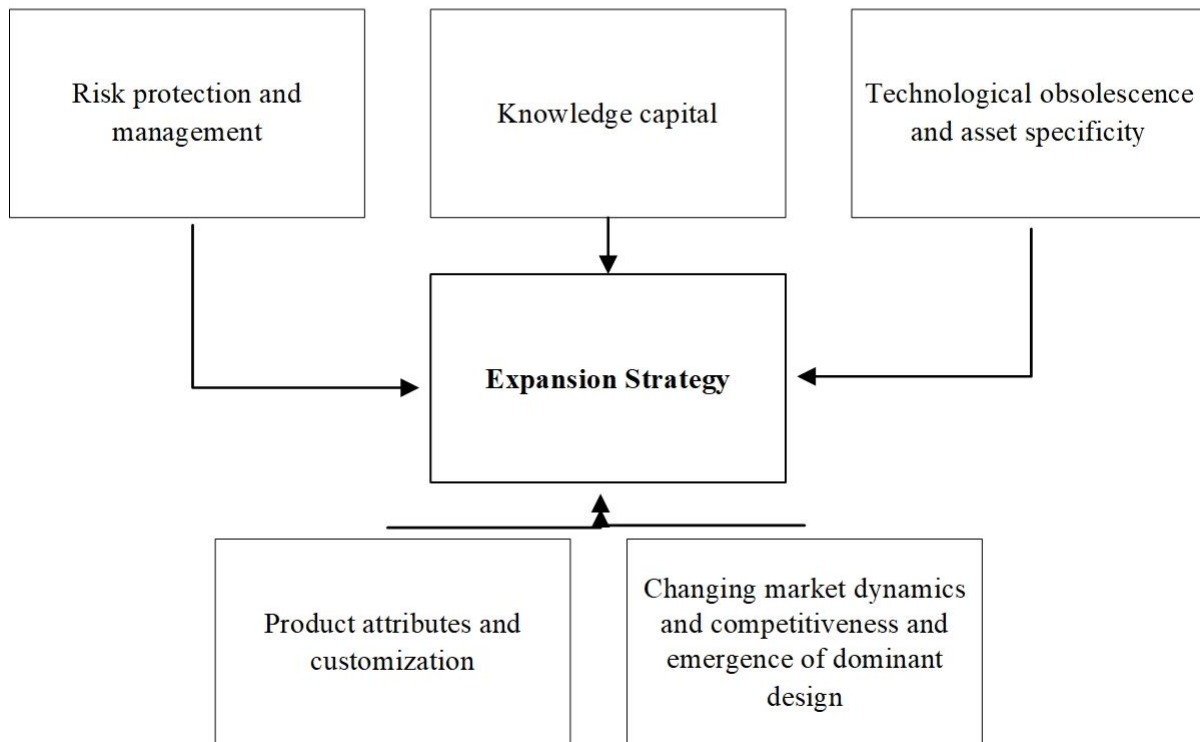
5.1 Inherent factors

Expanding any capital-intensive models in agrifood is always an intricate process (Price, 1993). Several options do exist for companies willing to extend a model, a proof of concept. The nature of organic and local growing food compels food production and manufacturing prevents a company from scaling operations up, or to extend a market. Not all models are extendable (Charlebois, Sterne and Buhr, 2014; Charlebois and Foti, 2017).

Some factors are to be considered when looking at perishable novel food products (see Figure 1). Technological obsolescence and asset specificity can impact the ability for a company to expand its operations (Powell and Snellman, 2004). The speed of innovation in agrifood has increased immensely over the last few years, in particular, in greenhousing (Tudorescu, Zaharia and Zaharia, 2008). Funding to support agricultural innovation has become more readily available and has helped the sector adopt new ways of producing more efficiently (Charlebois and Summan, 2014; Le Vallée and Charlebois, 2015).

Product customization can drive a food product or service provider in local markets. This is due to its capacity to adapt and change product lines beyond what has been systematically accepted elsewhere, in other markets.

Figure 1
Inherent Factors for Expansion of Food Processing and
Distribution Model



Knowledge capital and the ability to develop new methods are assets that cannot be overlooked. Food innovation is often driven from existing technologies, which are used creatively in combination with new technologies to form a uniquely different product, or method. This can be replicated with the appropriate strategy. However, switching costs, which create barriers to entry, for specialized foods are due to the establishment of a technological solution, patenting, meeting regulatory approval and brand assets in connection to markets (Utterback, 1994; Charlebois, Schwab, Henn and Huck, 2016).

Risk protection and management is also key when extending operations in food. Food safety is critical to food manufacturing, distribution, and service providers (Muneer et al., 2014). Regardless of the approach, both food safety and consistency of practices need to be preserved (Xiao, Nou, and Wang, 2014; Xiao et al., 2015). There are always risks for any firms to experience an outbreak. Extending a model compounds risks (Charlebois, Von Massow and Pinto, 2015).

A vital challenge to fruitful food product development today is the ability to recognize the

emergence of a potentially successful product and/or processing technology, which may be defined as a dominant design (Nordstrom and Bistrom, 2002). Therefore, changing market dynamics and competitiveness issues are worthy of consideration. Food trends can be short-lived and turn into fads, while others sustain the test of time. The key is to determine whether a product, or a product category, can become, over time, a dominant design. Market maturity is also a factor that needs to be captured through the expansion model.

5.2 Strategies to Expand

Options such as company-owned expansions, franchising, and licensing are all possibilities. Company owned expansions would imply that the central firm would own and control everything. This could also include a joint-venture with a partner. For partners, knowledge acquisition and learning are critical to joint ventures in a new market (Si and Bruton, 1999). In addition, the technical nature of the joint venture also affects its knowledge purpose and sharing. If firms employ high technology in their production processes, or patented self-crafted knowledge, communication between the parties is critical to the efficient functioning of the group (Newman, 1992).

Franchising has been a very popular choice over the past five decades or so (Castrogiovanni and Justis, 1998). Klein and Saft (1985) have stated that the essence of franchising lies in the conduct of business activities on-site in various local markets. Franchising allows a food processor to secure present and future market shares. Furthermore, the buying restrictions within the agreement can allow an organization to expand quickly. Building brand awareness in several markets can be quickly executed (Syed, 2011). Control over promotions is also key in franchising (Kerkovic, 2010). Little or no associated problems of staff and other administrative duties is a significant advantage as well. Training and the acquisition of technical expertise can go through different evolutions. That said, when human judgment and artistic attributes are not easily extendable, new product development and marketing efforts are created to adapt to local markets. With proper terms, support to expand locally is more possible as well (Wright, Frazer, and Merrilees, 2007).

Licensing, the option currently being pursued by GM, has been used in food distribution for decades (Henderson and Sheldon, 1992). Outbound licensing may be particularly attractive to companies with well-established, unique product images but with limited financial resources to underwrite the costs of entering a new market. Food processing firms operating in several markets, including internationally, see brand-name licensing as a better strategic alternative to trade and direct foreign investment under specific economic conditions. Licensing has several levels, including business and trademark licensing.

Dealerships and distributorships would be another option. The history of dealerships in food processing and distribution is not rich. Dealers tend to see the competition only in a local perspective, giving little importance to the markets where they do not operate. Manufacturers, on the other hand, tend to appreciate the competition with a broader perspective, considering the macro-implications of the competition and demand (Gabriel, Dorion and José Alberto, 2012; Charlebois, 2015).

6. Discussion

There are several observations GM ought to consider. The success of GM rests on one aspect of the business: quality. The focus for GM has been to take away market share from importers, particularly California. Americans have an advantage but GM appears to try to replicate what foreign suppliers' competitive advantage, while focusing on organic and local features as well.

“We are at the pinnacle of quality. The quality is the reason we are performing well. We need to compete against California. The shelf-life we offer makes the difference. The flavour really pops.”

Ian Adamson, President. GM

The size of the market for microgreens though remains unclear. There is little or no information about the potential of these crops. GM believes the microgreen market will peak in about 10 years and be at the point of saturation, but microgreens will always be considered as a premium product. Few would know how large the market is in North America. Applications for microgreens are endless. They can be incorporated onto salads, sandwiches, and other well-known dishes. But building awareness, and changing habits will be a challenge. Product positioning in stores is also critical. Time-crunched consumers who mostly shop the grocery store's perimeter are expecting to find packaged foods in the areas traditionally reserved for fresh produce. Microgreens does fit with such a strategy, but they are also competing against many other products (Abraham, 2016). In addition, being grown locally, or domestically, GM products are not exposed to currency fluctuations, affecting pricing, as it is the case for most imported vegetables.

The commercial operation of microgreens is likely to attract notable private investment, allowing a significant level of high quality facilities to be achieved. There is a reasonable amount of studies available on methods like urban farming that deals with its potential, its limitations, but few on microgreens specifically. A challenge for the company is to promote the product and create a category.

“Before I started here, I had no idea what microgreens were. We are creating a path, we are creating an image for microgreens in general.”

Christina Lee, Quality Manager

GM's expansion strategy seems to be a work-in-progress. Executives believe the model can be expanded. Barriers of entry are very high in the greenhouse industry, and in particular, for microgreens due to food safety measures. The aim is to create more facilities like Woodhill over the next few years. But time is of essence and how the expansion is executed will be key.

“We are still trying to figure out how licensing will work for us. In the States, we are trying to manage our risks differently.”

“The time is now for Microgreens. We believe we have one of the largest

retail-focus microgreen facility in the world. The shelf-time is the same as the growing time.”

Michael Curry, VP, GM

Marketing and promotion at GM are largely improvised, but very aggressive. A branding strategy at GM is not overly refined. No plans were given beyond the point of continuing to use Greenbelt Microgreens as a brand. It remains unclear if some branding adaptation is a possibility. The company's story is about the product, a new category in the vegetable section of a grocery store. Asked about the retail distribution landscape in Canada and in the U.S., GM does not seem all too worried. Whole Foods is soon to become a leading partner to GM, so an expansion in the U.S. is taking shape.

“Because of our connection with Whole Foods, we have a good position with Amazon. Drone deliveries are very compatible with our products, light. Whole Foods will be leading in some funds for our business. It's a true partner. We deal with Seattle. We will start shipping product to Seattle soon.”

Ian Adamson, President, GM

Branding is also a concern. Greenbelt Microgreens may not resonate with other markets. GM's leadership has acknowledged the issue, but does not seem to have plans to adapt its brand to other markets.

Another challenge for GM is technological evolution in agriculture. Lighting systems will help GM to become more productive, but the market sees new technologies being developed constantly. The Woodhill facility is currently being viewed as highly modern, but could become obsolete in just a few years. GM will need to maintain productivity and efficiency as technological knowledge in agriculture evolves. Expansion at the current location is possible since more land adjacent to the current facility is available. Upgrading the current facility at Woodhill has been expensive (\$5m approximately), but GM will likely need to invest more soon.

7. Conclusion

This case is about a company's pursuit to create a new product category. In an era in which vegetables and fruits are becoming more central to food policy, GM believes microgreens have a bright future. GM is a unique company with potential, but is also facing some challenges in the future. It's an experienced start-up. The best path forward for GM to expand its operations and its market is, however, unclear. Licensing seems to be working in both New York and British Columbia, but to determine what is the best approach to establish several more facilities will be a key focus for GM over the next few years. Despite developing robust production methods, connecting with key grocers, and developing good relationships with strong growers, GM is still exploring options.

More research on the nutritional benefits of microgreens is needed. Additionally, a better understanding of their market potential will be key for GM to expand its operations beyond

its current capacity.

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Appendix A

Products	Percentage of revenues
360mix	0.1%
Arugula	10.4%
Basil	1.7%
Beets	0.1%
Broccoli	7.8%
Buckwheat	0.0%
Cabbage	0.1%
Cilantro	1.3%
Cress	0.8%
Fresh Mix	4.6%
Fresh Mix Lettuce	1.4%
Greens	0.9%
Kale	2.3%
Peas	0.6%
Pea Shoots	8.3%
Radishes	1.0%
Ruby	0.0%
Ruby Mustard	0.0%
Shisho	0.1%
Shongiku	0.0%
Special Mix	0.0%
Spicy Mix	5.1%
Spicy Mix Lettuce	1.3%
Spring Lettuce Mix	1.5%
Spring Pea Mix	4.0%
Sunflower Mix	2.4%
Sunflower	9.0%
Sweet Crunchy	10.0%
Wasabi Mustard	0.1%
Wheats	0.0%
Wheatgrass	5.8%
Wheats - Buck Wheat	0.0%

Appendix B

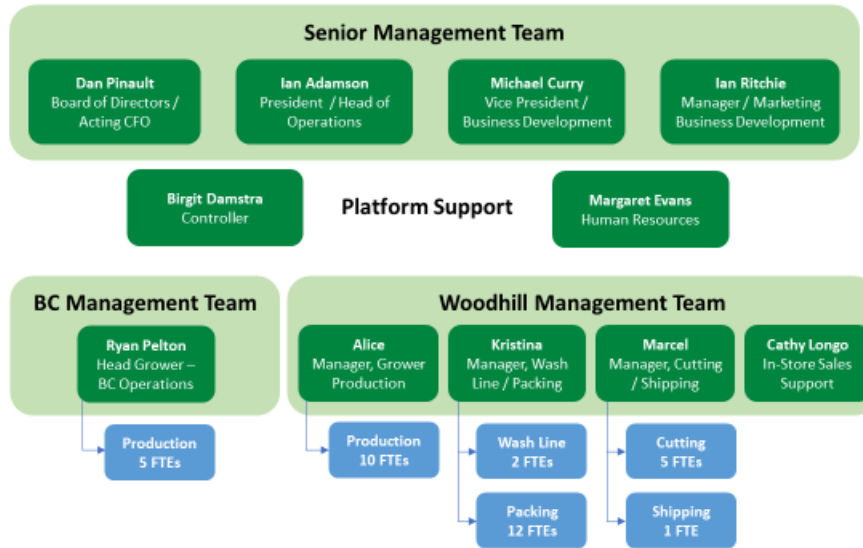


**Appendix C (Photo credits: Greenbelt
Microgreens)**



Appendix D

Strong management team being put into place



Strictly confidential information not for distribution
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