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9B18B007

KROEKER FARMS LIMITED: EXPAnDING HEMP PRODUCTION

Jessica Kelly wrote this case under the supervision of Mary Gillett solely to provide material for class discussion. The authors do not intend to illustrate either effective or ineffective handling of a managerial situation. The authors may have disguised certain names and other identifying information to protect confidentiality.

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In November 2016, Jason Peters, agronomist at Kroeker (pronounced “Kraiker”) Farms Ltd. (Kroeker), was meeting with staff to review the past season and prepare a capital budget proposal for the year ahead. Peters had worked at Kroeker for three seasons overseeing all non-vegetable crops, with a primary focus on the farm’s certified organic acreage. Kroeker had 500 acres of organic hemp in 2016 and planned to expand to 1,100 acres in 2017. Peters knew that the existing equipment used in hemp production was at capacity, so further investment in equipment was a necessity. However, he had to decide whether to simply buy larger field crop equipment or invest in newer technology. The new technology option would require equipment to be imported from Europe, so timing was critical.

KROEKER FARMS

History

Kroeker dated back to 1928, when Abram Kroeker, a second-generation immigrant, and his wife Elizabeth, sold their share in a family-run general store to begin a farm in Winkler, Manitoba. Initially the farm consisted of 280 acres of cultivated land and 80 acres of pasture and poplar bush and specialized in producing Yorkshire pigs and Latham raspberries. In response to the significant price, the weather, and the pest adversity he faced in his early years of farming, Abram Kroeker introduced corn production to the prairies, producing seed corn and constructing the first corn-drying kiln in Canada in 1936. The farm continued to grow rapidly and evolve over time. In 1942, potatoes became a main emphasis of production, and in 1955 the farm was incorporated, with Abram Kroeker and his nine children as shareholders.

As potatoes and other vegetables were typically grown in one year of a three-year crop rotation, Kroeker worked co-operatively with other farmers—renting land from other farmers in the “vegetable year” of their rotation and renting out land owned by Kroeker in “non-vegetable years” of the rotation. In 2000, Kroeker experimented with its first organic crop—30 acres of potatoes—motivated by the personal interests of both the farm manager and shareholders. Kroeker did not have partners to share the rotation schedule of its certified organic land, as it did with its conventional (i.e., not certified organic) production. As such, Kroeker maintained use of its certified organic land throughout its full crop rotation, which had evolved to be potato (or other vegetable), hemp, and green manure.[[1]](#footnote-1)

Current Operations

Kroeker had established itself as one of Canada’s leading potato growers and Manitoba’s largest grower of organic potatoes. The farm owned 11,000 acres of land throughout the Red River Valley. Of this land, 4,000 acres were certified organic—a significant increase from the 2,700 acres that were organic in 2015. Kroeker also had access to up to 9,000 additional acres through rental arrangements for conventional production. Although the farm had experimented with various crops over the years, the mainstay continued to be potatoes, along with some onions and specialty vegetables (carrots, broccoli, cauliflower, cabbage, and squash). Production of hemp, grains, and green manure rounded out the crop rotation on the organic land.

Almost all of Kroeker’s 4,000 acres of potato production (800 acres organic and 3,200 acres conventional) was for table potatoes (versus processing potatoes), sold through Peak of the Market, a not-for-profit marketing organization, under a number of different trade brands. Approximately 100 acres of organic onions was also sold through Peak of the Market each season. Extensive post-harvest potato and vegetable handling (including washing, sorting, storing, grading, and packing) was done by Kroeker. An additional 1,000 acres of seed potatoes was grown each year and sold directly to other growers. Marketing of all grain and hemp crops was also done in-house by Kroeker staff.

Kroeker continued to be headquartered in Winkler, where its facilities included potato storage bins; a potato washing and packing facility; an onion grading and storing facility; a repair shop; and a local food retail shop, The Potato Store. Given the geography of Kroeker’s farm land, some other areas had satellite locations with crop storage, equipment repair shops, and offices.

Across all operations, Kroeker employed between 300 and 400 staff depending on the time of year. Members of the Kroeker family no longer worked in the business, but they maintained a majority ownership stake. The farm’s shareholders and senior managers were looking for sound investment opportunities to improve the overall performance of the farm. They also had a keen interest in being on the leading edge of technology, having a tendency toward a why-not-try-it attitude with respect to the adoption of new technologies. Both shareholders and staff maintained a commitment to strong values related to tillage, land stewardship, innovation, and quality.

INDUSTRY INFORMATION

Potato Industry

In 2016, Manitoba was home to 19.6 per cent (67,673 acres) of Canada’s potato production, second only to Prince Edward Island.[[2]](#footnote-2) The average size of a potato farm in Manitoba was 415 acres, higher than in any other province and well above the national average of 110 acres.[[3]](#footnote-3) The majority of Manitoba’s potato production was for processing (86 per cent), with the remainder for the fresh, table market (7 per cent) and seed (7 per cent).[[4]](#footnote-4) The Keystone Potato Producers Association (KPPA) was the processing potato producer organization for Manitoba, while table potatoes were all contracted by Peak of the Market, a grower-owned, not-for-profit vegetable supplier operating in Manitoba under the Farm Products Marketing Act.[[5]](#footnote-5)

Organic Crop Production

The Canadian organic market had experienced rapid growth, quadrupling in less than 10 years to reach total sales of CA$4 billion.[[6]](#footnote-6) Under organic crop production, no synthetic fertilizers, synthetic pesticides, or genetically modified organisms were permitted. Without the option of synthetic pesticides, mechanical tillage was used extensively for weed control, and the windows of opportunity for weed control intervention were typically smaller than in conventional production. To become certified organic, farms had to meet all requirements set out in the Canadian Organic Standards and be inspected by an independent third-party verifier accredited by the Canadian Food Inspection Agency (CFIA).[[7]](#footnote-7) In order to convert conventional farmland to certified organic farmland, a producer had to accommodate a 36-month transition period, during which crops had to be grown under organic standards but could not yet be sold as certified organic.

Hemp Industry

Industrial hemp production had deep roots in Canada; it was one of the first crops that Samuel Champlain planted in Port Royal and ultimately Quebec.[[8]](#footnote-8) As a result of the anti-marijuana movement across North America, Canada introduced the Opium and Narcotics Control Act in 1938, banning the production of hemp.[[9]](#footnote-9) Hemp varieties with low levels of delta-9-tetrahydrocannabinol (THC) were later developed, and the ban was lifted in 1998, permitting the production of hemp under license with Health Canada.[[10]](#footnote-10)

Industrial hemp was viewed as a new alternative crop that complemented prairie crop rotations as it broke the traditional crop disease cycles affecting cereals and offered enhanced cropping profits.[[11]](#footnote-11) Hemp was also an adaptable crop that could be grown in a variety of climates and soil types. The land licensed for hemp production in Canada increased from 3,250 acres in 2001 to 66,700 in 2013; 22 per cent of this land was in Manitoba.[[12]](#footnote-12)

Industrial hemp was a versatile crop with both grain and fibre uses, even though the market opportunities for grain were the main driving force behind the acreage in Canada. In Manitoba, a number of companies had contracted hemp seed production for use in a range of food products (e.g., oil, dehulled hemp seeds or nuts, milk, flour, toasted hemp seeds, coffee, butter, and protein powder) and body care products (e.g., shampoo, conditioner, hand lotion, and lip balm). Hemp fibre was well-suited as a substitute for non-renewable sources of fibre and could be used in products such as paper, insulation, or bio-composites.[[13]](#footnote-13)

ORGANIC HEMP EXPANSION OPPORTUNITY

During the 2016 season, Kroeker had produced organic hemp on 500 acres as part of its three-year organic potato rotation. This production was all done with 12-row, row-cropping equipment (typically used for corn, wheat, or edible beans), which planted on 22-inch row spacing. Row-cropping cultivators were taken through the fields an average of two and one-half to four times between planting and the crop having canopy closure. Although this production approach had worked in the past, the existing equipment was at maximum capacity with 500 acres. In 2017, Kroeker planned to more than double its hemp acreage to 1,100 acres. As such, Peters was exploring two different capital investment options for the year ahead.

Regardless of which equipment investment was made, Peters anticipated that the 600 additional acres of hemp would bring in $1 million in additional revenue annually beginning in 2017. The operating costs associated with soil fertility ($125 per acre) and with harvesting, drying, hauling, storing, and working the field before and after the crop ($230 per acre) would be the same under both options. Since these revenues and costs would be the same regardless of the equipment investment made, Peters decided to exclude these values from his analysis.

Option 1: Camera Cultivator and Air Seeder

Peters had first seen a camera cultivator in action at another Manitoba farm in 2015 and was intrigued about its potential uses at Kroeker. Camera cultivators operated by using a camera to “see” the contrast between the green row of a newly germinated crop and the dark soil. The contrast was used to guide the cultivator shovels, using a moving hitch, to stay between the crop rows. This precision enabled the cultivator to be used on more narrowly seeded, or solid-seeded crops.

After researching different options, Peters settled on the Austrian-manufactured, 2016 Einböck Chopstar, which was 43.5 feet wide, covered 52 rows with 10-inch spacing, and cost $128,000. Peters was excited about the possibility of adopting this cutting-edge technology, particularly for its potential weed-control benefits. If he planted on 10-inch rows instead of 22-inch rows, he estimated that the crop would reach full canopy stage much more quickly. This technology would also reduce the number of cultivator passes to two per growing season and reduce overall weed pressure in the hemp and in the green manure and vegetable crops grown on that land in other years of the rotation. This factor was particularly important in vegetable crops such as onions, as much of the weeding was done with human labour. Peter had a gut feeling that the reduced weed pressure from using the camera cultivator could result in annual labour savings across the farm of $20,000, beginning in the third growing season (when contrasted with using row-cropping equipment). However, many other factors could affect overall weed pressure, so he was not overly confident in this estimate.

As with any change involving new technology, Peters had some reservations. First and foremost, the camera cultivator had been used commercially in grain crops before but never in hemp. He wondered how a poorer hemp crop with some gaps in the rows might affect the camera’s ability to operate. If Peters planted hemp on 10-inch rows and the camera cultivator was not effective, he would have no other option for mechanical tillage for weed control in the crop. In this instance, Peters could run the risk of losing up to 50 per cent of the hemp crop and be faced with major weed pressure headaches in future growing seasons. There were further unknowns: for example, he did not know how fast the cultivator could be used in hemp and thus the acreage capacity of the equipment. Solid-seeded hemp meant there was a shorter window of time for weeds to thrive before full canopy was reached, but it also meant a shorter window of time to cultivate for weed management. Missing these opportunities due to capacity constraints would negate all potential weed control benefits of the camera cultivator. Conversely, excess capacity would allow Kroeker to capitalize on the cultivator’s versatility by using it in other solid-seeded crops, including grains and green manure. Peters had some hesitations around contingency planning as well. The closest dealer for the camera cultivator was located in Ontario, and he wondered about access to technical support and repair parts.

Due to its high level of precision, the camera cultivator had to be calibrated directly with a specific air seeder, and Kroeker’s existing air seeder was too small and outdated to meet this need. As a result, Peters selected a new air seeder a 2013 John Deere 1895, which cost $200,000 and would plant 52 rows on 10-inch spacing. As an added benefit, this air seeder had the capacity to plant in a wider range of conditions than Kroeker’s existing air seeder. Both the camera cultivator and air seeder could be used with an existing tractor in Peters’s division of the farm. Although staff were keen to use new technology, he wondered about potential staff frustrations related to training, new processes, and learning to use new equipment.

Based on using an air seeder on 10-inch rows, Peters estimated that seed cost would be $60 per acre. He knew that the cost to operate the air seeder and existing tractor was $3.50 per acre for the season, including the cost of fuel, tractor operator, and repairs. Similarly, the cost to operate the camera cultivator and existing tractor was $1.50 per acre, per pass through the field. He expected that replacement of cultivator shovels would be the primary maintenance cost. Kroeker tended to turn over its tractors frequently and typically while still under warranty, so the main costs were regular maintenance such as oil changes. Peters knew that the seeder would hold its value, estimating a re-sale value of $150,000 after the end of five seasons. In contrast, the degree of specialization of the camera cultivator would mean quite a limited pool of prospective buyers. Peters estimated a potential re-sale value of $40,000 at the end of five seasons.

Option 2: New Planter and Cultivator

The second option that Peters considered was investing in 24-row row-cropping equipment (versus the current 12-row equipment) in order to accommodate the new acreage. With its larger capacity, this equipment was the best choice because Peters had been using the same production practices on the existing hemp. He settled on the John Deere DB44 24-row planter, which cost $130,000 and used central seed delivery on 22-inch spacing between rows. For a cultivator, Peters selected the Elmers 24-22, costing $80,000. Having used similar equipment previously, Peters knew these two pieces of equipment would have the capacity to service the new expanded hemp area. This equipment would have limited use beyond hemp as all other crops that Peters oversaw were solid-seeded.

Planting hemp on wider rows and delaying canopy cover would mean the management required for weed control would be heightened. Based on past experience, a row cultivator would typically be taken through a field two and one-half to four times on average, per season, before canopy was reached. Weeds could possibly overtake a hemp crop, particularly if a shorter hemp variety were being grown. If this were the case, yield reductions could be about 20 per cent.

Additionally, this equipment required a larger tractor than Peters currently owned within his division. A tractor could be borrowed from another division of the farm, but Peters was not confident that one would be available during the periods of the season that he needed it. Particularly for cultivating, the window of opportunity was often quite small, so Peters risked not having full control over when this could be done. A second option was to rent a tractor from a local equipment supplier. Peters estimated that this would cost $2 per acre for planting and $2 per acre for each cultivator pass. Peters did not consider purchasing a new tractor specifically for this purpose.

Peters estimated that seed cost with row seeding would be one-third less than with solid seeding, at $40 per acre. He calculated that the cost to operate the row planter and the larger tractor would be $2 per acre for the season, including the cost of fuel, tractor operator, and repairs. The cost to operate the row cultivator and tractor was $1.50 per acre, per pass through the field. Peters knew that the seeder would hold its value fairly well, estimating a re-sale value of $80,000 after the end of five seasons. In contrast, the re-sale market for these types of cultivators had deteriorated in recent years due to changes in the sugar beet industry. He estimated a potential re-sale value of $20,000 at the end of five seasons.

Peters recognized that each of these new machinery purchases would qualify for a capital cost allowance of 30 per cent per year. Kroeker depreciated all equipment on a 20 per cent declining balance basis, but Peters expected that all equipment under consideration would still be in use on the farm in 15 years. Kroeker’s tax rate was 21 per cent, and for the most part, its capital investments were financed internally and paid with cash. On the other hand, Peters knew that Kroeker’s shareholders were typically looking for returns of 10 per cent.

FINAL DECISION

Peters had to figure out the costs for these two equipment options, but he knew that financials were only part of the story. He had to consider other factors such as the risk of investing in new technology versus investing in larger row-cropping equipment that had worked in the past for hemp on the farm but that was at its maximum capacity. Kroeker’s farm manager was ultimately responsible for approving capital investment decisions considering the overall farm budget, return on investment, and areas of highest need across the entire farm business. Peters knew that he would need to consider the manager’s perspective in order to build a convincing case for whichever option he recommended.

1. Green manure was a crop or plant that was grown and then intentionally ploughed under to improve the fertility of the underlying soil. [↑](#footnote-ref-1)
2. “Table 004-0213: Census of Agriculture, Hay and Field Crops, Every 5 Years,” Statistics Canada, May 10, 2017, accessed November 17, 2017, http://www5.statcan.gc.ca/cansim/a26?lang=eng&id=40213. [↑](#footnote-ref-2)
3. Ibid. [↑](#footnote-ref-3)
4. “Agriculture and Food Processing—Commodities: Special Crops, Potatoes,” Manitoba Trade and Investment, accessed November 17, 2017, https://www.gov.mb.ca/trade/globaltrade/agrifood/commodity/potatoes.html. [↑](#footnote-ref-4)
5. Ibid. [↑](#footnote-ref-5)
6. Canadian Organic Growers, “Manitoba Organic Research Hits Major Milestone,” Canada Organic, September 13, 2016, accessed November 24, 2017, https://organicweek.ca/manitoba-organic-research-hits-major-milestone/; All currency amounts in CA$ unless specified otherwise. [↑](#footnote-ref-6)
7. “Organic Definitions,” Manitoba Organic Alliance, accessed November 24, 2017, http://manitobaorganicalliance.com/about-organics/organic-definitions/. [↑](#footnote-ref-7)
8. “The Canadian Hemp Trade Alliance (CHTA),” CHTA: Canadian Hemp Trade Alliance, accessed November 22, 2017, www.hemptrade.ca/. [↑](#footnote-ref-8)
9. “Industrial Hemp Production,” Manitoba: Agriculture, accessed November 22, 2017, https://www.gov.mb.ca/agriculture/crops/production/hemp.html. [↑](#footnote-ref-9)
10. Ibid. [↑](#footnote-ref-10)
11. Ibid. [↑](#footnote-ref-11)
12. Ibid. [↑](#footnote-ref-12)
13. Ibid. [↑](#footnote-ref-13)