

The Potential for Exporting Blackberry Seeds from Canada to Nepal

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Introduction

The purpose of this paper is to examine the potential of an export project involving blackberry seeds, which will be sent from Canada to Nepal. T&T Seeds, a seed company located in Headingly, Manitoba, will ship Thornless Chester blackberry seeds to Anamolbiu Seed Company in Bharatpur, Nepal. This export project will result in a number of benefits for both Canada and Nepal, but will also present some challenges that must be overcome.

Section One: Product Information

Thornless Chester Blackberry Seeds

Blackberries, or *Rubus fruticosus*, can be classified into three types according to their cane structures: trailing, semi-erect and erect (Du, Kurnianta, McDaniel, Finn & Ojan, 2010). Refer to Figure 1 for an image of blackberries. Thornless Chester (TC) blackberries are the predominant semi-erect blackberry cultivar grown worldwide (Du et al., 2010). Blackberry thorns are a risk to consumers if they end up inside the berry, which is the major reason why seeds from a thornless blackberry cultivar were selected for the project.

TC blackberry seeds form large arching canes with very vigorous vines (T&T Seeds, n.d.). Refer to Figure 2 for an image of blackberry plants. Spacing between plants is very important due to the fact that the vines can easily grow to be 2-3 meters in length. One TC blackberry plant can produce up to 20 pounds of large, sweet berries if grown under ideal conditions (T&T Seeds, n.d.). This type of blackberry plant is self-pollinating.

Figure 1: Blackberry Fruit



<http://plant.daleysfruit.com.au/trees/m/Blackberry-Thornless-Chester-860.jpeg>

Figure 2: Blackberry Plant



http://www.fruitsandberries.com/images/products/secondary/doyle_s%20thornless%20blackberry--3.jpg

Health Benefits of Blackberries

Blackberries are a very nutritious food. They contain a high level of anthocyanins and other phenolic compounds that are responsible for their high antioxidant capabilities (Kaume, Howard & Devareddy, 2012). The consumption of antioxidants could decrease the risk of developing a number of health conditions, including obesity, coronary heart disease, various types of cancer as well as degenerative conditions such as Alzheimer's disease (Kaume et al., 2012). Anthocyanins in particular have been reported to display anti-inflammatory, anti-viral and anti-carcinogenic properties (Kaume et al., 2012).

In addition to their antioxidant properties, blackberries are also an excellent source of fibre and other essential vitamins and minerals. A 100-gram serving of raw blackberries provides 43 calories, 5.3 grams of fibre, 20 milligrams of magnesium, 29 milligrams of calcium, and 162 milligrams of potassium (Health Canada, n.d.).

Potential Uses of Blackberries in the Nepalese Diet

It is important to consider the dishes that make up Nepalese cuisine when attempting to introduce a new food product to a culture, as this export project is trying to do. Nepalese cuisine is heavily influenced by the cuisines of India, China and Tibet (Pearce, n.d.). Yogurt is very popular in Nepalese cuisine; it is used in desserts, as a side dish and in drinks (Pearce, n.d.). Blackberries could be incorporated into yogurt-based dishes, such as lassi, which is a yogurt-based drink. They could also be consumed raw, as a snack or dessert.

T&T Seeds

Figure 3: T&T Seeds Logo



<http://www.ttseeds.com/PHP/home.php>

T&T Seeds Ltd. will provide the blackberry seeds that will be exported from Canada to Nepal. This company has been in the mail-order seed business since 1946. The current owners are Kevin and Brian Twomey. Refer to Table 1 for contact, price and shipping information. They carry out the bulk of their business in the Prairies, however British Columbia and Ontario are becoming steady sources of revenue as well (T&T Seeds, n.d.). The original T&T Seeds location was in downtown Winnipeg, Manitoba but they later moved to Headingly, Manitoba in order to expand their operating capacity. T&T Seeds has a 16,000 square foot warehouse for distributing orders across Canada, as well as a few greenhouses for producing bedding plants. In addition to a variety of vegetable, fruit and flower seeds, they also supply fruit trees, shrubs and health products (T&T Seeds, n.d.). The wide selection of products is due to the strong relationships they have with their suppliers. The same eight to ten companies from the US and Europe have been supplying their seeds for over thirty years (T&T Seeds, n.d.). T&T Seeds prides itself in providing high quality products at reasonable prices.

Table 1: T&T Seeds Contact Information, Blackberry Seeds Product Information

T&T Seeds Contact Information	Product Information: Thornless Chester Blackberry Seeds	Price & Shipping Information
Mailing address: T&T Seeds Ltd., Box 1710, Winnipeg, Manitoba R3C 3P6	Blackberry Chester Catalog number: 8078	Size A packets: \$18.95
Garden center address: 7724 Roblin Boulevard, Headingly, Manitoba R4H 1B2	Catalog page: 86	Size B packets: \$34.95
Phone number: 204-895-9962 Email: Garden@ttseeds.com	Size A seed packet: 2 canes Size B seed packet: 4 canes	Shipping within Canada: \$9.95 for seed orders over 10 packets, size A and B packets

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Product Transportation: Shipping Blackberry Seeds from Canada to Nepal

Overview of Shipping Process

The first shipment of blackberry seeds for this export project will include 25 size A (small) packets of seeds. Each packet of seeds is enough to grow two canes of blackberries (T&T Seeds, 2016). The seeds will be shipped from T&T Seeds in Winnipeg, Manitoba to a warehouse storage facility in Toronto, Ontario. The seeds will be shipped via A1 Freight Forwarding from the warehouse in Toronto to Tribhuvan Airport in Kathmandu, Nepal. From there, the seeds will be shipped to Anamolbiu Seed Company in Bharatpur, Nepal using the Nepal Government Postal Services Department. The seed package will be sent from the general post office in Kathmandu to the domestic post office in Bharatpur via domestic high speed, low premium delivery service (General Post Office Nepal, n.d.).

Anamolbiu Seed Company will carry the seeds for purchase by farmers or families who are interested in growing blackberries. This is a seed company that has produced quality seeds for more than 25 different vegetables, cereals, pulses and potatoes (Anamolbiu, n.d.). Their seeds are produced in Nepal in partnership with farmers' groups, which could represent a challenge for this export project. It might take some convincing to persuade Anamolbiu Seed Company to purchase the imported blackberry seeds and offer them for sale in their store. Culturally appropriate marketing techniques must be used to explain the value of the seeds as well as planting instructions for the imported seeds.

Shipping Costs

T&T Seeds ships their products within Canada using Canada Post. The shipping cost for an order of 25 size A seed packets from Winnipeg to Toronto is \$9.95, and the GST/HST is \$56.72 (T&T Seeds, 2016). A1 Freight Forwarding will ship the seeds, which are estimated to weigh 20 kilograms, from Toronto to the Tribhuvan airport via airfreight for \$294.00 CAD (A1 Freight Forwarding, n.d.). From the Tribhuvan airport, the Nepal postal service will ship the seeds to the district post office in Bharatpur, Nepal for 16,050 Nepali Rupees, which converts to \$197.88 CAD (The Money Converter, n.d.). Anamolbiu Seed Company will need to pick up the seed package from the Bharatpur post office. Refer to Table 2 for a comprehensive breakdown of shipping methods and costs.

Table 2: Shipping Costs of Blackberry Seeds from Canada to Nepal

Location	Shipping Method	Shipping Cost (CAD)
Winnipeg to Toronto	Canada Post	\$9.95
Toronto to Kathmandu	A1 Freight Forwarding	\$294.00
Kathmandu to Bharatpur	Nepal Postal Services: Kathmandu Post Office: 44600 Sundhara Marg, Kathmandu Bharatpur Post Office: 44207 Munal Chowk Road, Bharatpur	\$197.88

Total Shipping Cost:	\$501.83
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Competition: Blackberry Seeds Imported from Canada vs. Blueberry Seeds Imported from China
Cost of Blackberry Seeds from T&T Seeds

The total cost of the order, including shipping within Canada and GST/HST, is \$540.42 CAD (T&T Seeds, 2016). The additional cost of shipping the seeds to Nepal via A1 Freight Forwarding is \$294.00, and the cost to ship the seeds from the Kathmandu to Bharatpur is \$197.88. This brings the order total to \$1,032.30.

Cost of Competing Seeds

A product search on *Alibaba.com* resulted in two products that could be considered competitors to the TC blackberry seeds from T&T Seeds. The first is blackberry seeds from Chemipan Corporation Company Ltd., which is a manufacturing and trading company located in Bangkok, Thailand (*Alibaba.com*, n.d.). However, this product is not a direct competitor with the export product because the blackberry seeds supplied by this company are intended for use as decoration in body scrubs, not for planting. Also, after a price inquiry sent to the company, it was revealed that the product is no longer available for sale (N. Pongthanya, personal communication, November 15th, 2016). For these reasons, this product is not in direct competition with T&T Seeds' TC blackberry seeds.

The major competitor to T&T Seeds' product are blueberry seeds sourced from Shanghai Herbarry Biotechnology Company Ltd. These seeds originate from Shanghai, China and are intended for planting purposes (*Alibaba.com*, n.d.). Blueberries are very similar to blackberries in terms of their characteristics and uses, which makes this product a direct competitor with TC blackberry seeds. Refer to Table 3 for a complete breakdown of shipping and product costs for the competing products. The freight on board price for the blueberry seeds is \$182.16/kg CAD, however, a discounted price of \$128.18/kilogram CAD could be negotiated for an order of 25 kilograms (A. Lee, personal communication, November 16th, 2016). It is unclear how much of the shipping costs will be paid by the seller, so the calculation in Table 3 disregards this cost. The total cost for a 25-kilogram order of blueberry seeds would be \$3,204.50 CAD, excluding shipping.

Cost Analysis

Based on the costs detailed above and in Table 3, ordering TC blackberry seeds from T&T Seeds would be more cost-efficient than purchasing blueberry seeds from Shanghai Herbarry Biotechnology Company in Shanghai. It would cost \$2,716.97 more to purchase blueberry seeds from China compared to blackberry seeds from Canada, excluding shipping costs. For this reason, it would be more beneficial to Nepal to import blackberry seeds from Canada compared to importing blueberry seeds from China.

Table 3: Cost Comparisons of Blackberry Seeds from T&T Seeds in Canada vs. Blueberry Seeds from Shanghai Herbarry Biotechnology Company in China

Costs (CAD)	Blackberry Seeds from T&T Seeds	Blueberry Seeds from Shanghai Herbarry Biotechnology Company
Product Costs (CAD)	25 size A packets: \$473.75	25 kilograms of seeds: \$3,204.50

Shipping Costs (CAD)	From Winnipeg to Toronto: \$9.95 From Toronto to Kathmandu: \$294.00 From Kathmandu to Bharatpur: \$197.88 Total Shipping Costs: \$501.83	N/A
Tax	GST/HST: \$56.72	Sales tax:17% (Trading Economics, n.d.) \$544.77
Total Costs (CAD)	\$1,032.30	\$3,749.27

Benefits to Canada from Exporting Blackberry Seeds to Nepal

The export of TC blackberry seeds from Canada to Nepal will result in a number of positive effects on the Canadian economy. T&T Seeds will experience growth from the project, resulting in the need to hire more employees to process and fill orders. It is possible that the increased revenue from the boost in sales could result in higher wages for both existing and new employees, which would benefit the local economy in the Winnipeg/Headingly area of Manitoba. Other firms who are involved in transporting the seeds from T&T Seeds to Nepal would also benefit from increased business, such as the warehouse in Toronto where the seeds will be stored prior to shipment and A1 Freight Forwarding, the company that will transport the seeds to Nepal.

This project will also result in increased attention on the role that the Canadian agriculture and agri-food sector can play in addressing global food security. If this project is successful, the partnership between T&T Seeds and Anamolbiu Seed Company could be used as a model for similar future endeavors. Perhaps more Canadian agri-food products could be exported to Nepal in order to continue the effort to address the nation's food insecurity.

Section Two: Critical Analysis of Potential Benefits to Nepal

Background Information About Nepal

Nepal is located in Southern Asia, between China and India (Central Intelligence Agency [CIA], n.d.). Refer to Figure 3 for a map of Nepal. It is a landlocked country that can be divided into three topological regions: the terai, the mid-hills and the mountain regions. In terms of land uses, 28.8% is used for agriculture (CIA, n.d.). Of this, only 15.1% is considered arable land appropriate for growing crops; 12.5% is allocated to permanent pasture, with the remaining 1.2% used for permanent crops. Nepal is prone to a number of natural disasters, such as flooding, landslides, and drought (CIA, n.d.). On April 25th, 2015 Nepal was hit with a 7.8 magnitude earthquake that resulted in massive damage and approximately 8700 deaths and 22,000 injured people (Mercy Corps, 2016).

Nepal is the 46th largest country in the world in terms of population, with a population of 29, 033, 914 as of July 2016 (CIA, n.d.). Nepali is the official language, however many people who work in government or business also speak English. The primary religions are Hinduism, Buddhism and Islam. The capital city is Kathmandu, where 1.183 million people live (CIA, n.d.). The life expectancy for Nepali males is 70.1 years, while for females it is 71.3 years. 76.4% of

the male population over 15 years of age are literate, while only 53.1% of the female population over 15 can read and write (CIA, n.d.).

Nepal is a very poor country. About one quarter of its population lives below the poverty line (CIA, n.d.). Agriculture is the largest sector of the economy, employing around 70% of the population and accounting for about one third of the gross domestic product. The major agricultural products grown in Nepal include pulses, rice, corn, sugarcane, wheat, root crops and milk/meat from water buffalos (CIA, n.d.). The Nepali labour force is characterized by a severe lack of skilled labour, with only 12% of the population working in industry. The unemployment rate in Nepal is 46%, contributing to the large percentage of the population living below the poverty line (CIA, n.d.).

Figure 3: Map of Nepal



<http://i.infopls.com/images/mnepal.gif>

Agriculture and Food Insecurity in Nepal

The current level of food production in Nepal is not sufficient to meet the requirements of the growing population. In fact, the production of most cereal and horticultural crops are far below those of surrounding countries (Sherchan & Karki, 2006). Subsistence agriculture is the major system in Nepal, meaning that farmers grow just enough food to feed their families (Sherchan & Karki, 2006). In order to increase the livelihoods and food security of the Nepali population, a shift towards commercial agriculture must occur. This shift requires skilled labour, market assurance and investment, all of which are hard to come by in Nepal (Gautam, 2013). Some of the challenges facing agriculture in Nepal include lack of appropriate technology, erosion in the hills and mountains and a lack of new arable land that is not already under cultivation (Sherchan & Karki, 2006).

A study found that 42 out of 75 districts in Nepal were considered food deficient in 2007 (Sreeramareddy, Ramakrishnareddy & Subramaniam, 2015). In 2010, it was found that 3.6 million people were food insecure in Nepal, with the most severe food insecurity found in the hill and mountain districts (Food and Agriculture Organization [FAO], 2010). At this point in time, the FAO characterized the level of hunger as serious, indicating that 10-19% of the population was undernourished (2010). In general, food insecurity is associated with a number of micronutrient deficiencies, including calcium, selenium, iron, zinc, iodine and vitamin A deficiencies (Kumssa, Ander, Watts, Young, Walker & Broadley, 2015). These deficiencies are particularly detrimental in young children as they can cause stunting and wasting

(Sreeramareddy et al., 2015). Increasing food supply through improved agricultural techniques is an important step towards improving food security in Nepal. Growing blackberries in Nepal can increase the population's access to nutritious food.

Horticulture in Nepal

Horticulture in Nepal represents an opportunity to improve the livelihoods of farmers. Horticulture's contribution to Nepal's GDP was approximately 14% in 2004 (Khatri, Sharma, Khatiwada, Paudyal, Khadge & Regmi, 2004). A variety of horticultural crops, including fruit, vegetables and flowers, can be grown in Nepal due to the range of altitudes and climates found throughout the country (Gurung, 1993). The plains of the terai are appropriate for the cultivation of mango, guava, papaya, pineapple, lychee and banana (Gurung, 1993). The mid-hills region is the most suitable for growing fruit crops; it can support the growth of citrus fruits, peaches, plums and pears. Fruit cultivation does not comprise a large component of agriculture in Nepal; it is mostly limited to backyard gardens for home consumption (Gurung, 1993).

The shift from subsistence to commercial agriculture in Nepal can be aided by horticulture because of the export promotion and import substitution potential of fruit crops (Khatri et al., 2004). Currently, only 1% of Nepali market demand for fruit is satisfied by domestic production (Gautam, 2013). The majority of bananas, apples, pomegranates and citrus consumed in Nepal are imported from China and India (Gautam, 2013). If fruit production in Nepal were to increase to satisfy the domestic market and support an export market, the livelihoods of Nepali farmers would greatly improve. Horticultural crops are high value commodities, meaning they will provide farmers and their families with higher incomes, helping to alleviate poverty in Nepal. Exporting fruit and other horticultural crops from Nepal is possible due to the fact that Nepal is a member of the World Trade Organization. With this membership, Nepal is able to export to international markets, indicating that increased fruit production would result in significant contributions to the country's economy (Gautam, 2013).

Target Market in Nepal for Imported Blackberry Seeds

The imported TC blackberry seeds will be available for sale from Anamolbiu Seed Company, which is located in the Bharatpur, Nepal. There are two main target markets for this product. The first are farmers in rural areas of Nepal who are interested in growing blackberries for sale or for home consumption. The second target market is urban dwellers (likely from Kathmandu) that are hoping to grow blackberries in an urban agriculture-type system for home consumption.

Challenges of Importing Seeds to Nepal

The Seed Quality Control Centre, which is housed within the Ministry of Agricultural Development in the Government of Nepal, is tasked with ensuring the availability of high quality seeds for farmers (Government of Nepal, n.d.). One of their objectives is to substitute imported seeds with those sourced domestically. This represents a challenge for this export project. A possible solution would be to explain the many benefits that the imported blackberry seeds will bring to Nepal in a way that is culturally appropriate. For example, a visual presentation such as

a brochure could demonstrate what blackberries look like, how they grow, their nutrient values and the revenue that could be received from growing them.

Growing Blackberries in Nepal

Optimal Growth Conditions for Blackberries

Blackberries grow best in areas with mild winters because they are not winter-hardy plants (Sullivan & Clarke, 2016). The ideal area to grow blackberries would be one with a lot of sun and a sandy loam soil. Clay soils should be avoided because of poor drainage characteristics, which would cause the roots of the blackberry plant to die (Sullivan & Clarke, 2016). The soil pH should be between 5.5 and 7 for optimal growth (Mierzejewski, 2015). The soil should be prepared one full year prior to planting blackberries. Organic matter such as well-rotted manure should be applied to the soil because it improves water and air movement, increases the water holding capacity of the soil, and favours the growth of helpful soil microorganisms (Sullivan & Clarke, 2016).

Blackberries should not be planted in areas where tomatoes, eggplant, strawberries or potatoes have been grown because of the potential presence of root diseases that are able to infect the blackberry plants (Sullivan & Clarke, 2016). The plants should be grown in rows, with at least 2 meters between each plant (T&T Seeds, n.d.). It is important to control weed growth because they compete with the blackberry plant for nutrients and moisture; biodegradable plastic mulch could be used to accomplish this (Sullivan & Clarke, 2016). Around 25 millimeters of water per week should be applied to plants for optimal growth (Sullivan & Clarke, 2016).

There will be no blackberry crop in the first year of planting. The second year will produce a small crop, and in the third year the plant will reach its full production capacity (Sullivan & Clarke, 2016). Blackberry plants that are properly cared for should remain productive for 15-20 years (Mierzejewski, 2015).

Growing Blackberries in the Mid Hills Region of Nepal

Nepal is predominantly composed of hilly and mountainous topography. In fact, approximately 35% of Nepal is mountainous, and 42% is hilly (Khatri et al., 2004). Around 75% of the arable land of mountains and hills in Nepal is not suitable for cereal crop production, but could be used successfully for horticulture (Khatri et al., 2004). Based on this information, the mid hills region of Nepal would be most suitable for growing blackberries. This region has a warm temperate climate and is already used for growing many fruit crops. The mid hills of Nepal are primarily silt-loam soils, which is appropriate for growing blackberries. However, there are a number of challenges facing horticulture and agriculture in the mid hills of Nepal. Due to the fact that this region is characterized by sloping agriculture, there is excessive drainage and shallow soil depth that ultimately results in soil degradation and loss (Tamang, Thapa, Pudasaini, Paudel, Crow, Halbrendt, Radovich & Chan, 2015). Conservation agriculture (CA) is a potential solution to this issue, which would make growing blackberries in this area more productive. CA follows three main principles: minimum/no tillage, the use of intercropping, and crop rotation; it offers the following benefits: increased crop productivity and reduced production costs (Tamang et al.,

2015). If these practices are followed, blackberry production in the mid hills region of Nepal could be productive and lucrative.

Benefits to Nepal

Nepal will experience a number of benefits from this export project. Growing blackberries in Nepal will reduce the country's reliance on imported fruit from India and China. This will keep revenue generated by domestic fruit production within the Nepali economy, thereby improving the livelihoods of Nepali farmers. The increasing urbanization of Nepal is creating a high demand for agricultural commodities in large cities such as Kathmandu, which represents an opportunity for blackberries to be sold as a niche product in this market (Gautam, 2013). Growing blackberries will also improve the overall food security and nutritional status of the population by increasing their access to fresh, nutritious fruit. Blackberry production will also result in job creation, especially for rural youth who often travel overseas in search of employment (Gautam, 2013). If blackberry production becomes highly productive in Nepal, the creation of an export market for this product is possible, resulting in economic growth for the country.

Future Studies Required to Address Unknowns

This analysis has revealed some unknowns that should be addressed in order to improve the feasibility and success of exporting blackberries seeds from Canada to Nepal. A study should be undertaken to determine the potential of growing blackberries in other regions of Nepal, such as the mountain or terai regions. This knowledge would spread the benefits of the project to more areas of Nepal, thereby further improving the livelihoods of the Nepalese. It would also be important to study the potential uses of blackberries grown in Nepal, such as further processing into jams, juices, alcoholic products or extracts. By discovering the potential value-added products that could be made from blackberries, more jobs in agri-food processing could be created, thereby improving to the Nepali economy. Studies should also be undertaken to determine if it would be possible to produce Thornless Chester blackberry seeds within Canada instead of sourcing them from the United States or Europe, as this would further benefit the Canadian economy.

Critical Summary and Recommendations

The benefits to both Canada and Nepal from exporting blackberry seeds are compelling and result in the following recommendation: this export project should be pursued. Canada will benefit from job creation along the supply chain as well as renewed interest in the role that the Canadian agri-food sector can play in addressing global food security. Nepal will benefit from improved food security and nutritional status, reduced reliance on imported fruits, job creation and the potential of exporting blackberries to international markets. Based on the cost analysis detailed earlier in the paper, it would be more cost effective for Nepal to import blackberry seeds from T&T Seeds in Canada compared to importing blueberry seeds from Shanghai Herbary Biotechnology Company in China. With further research on expanding the areas where

blackberries can be successfully grown in Nepal, this project has the potential to greatly improve the livelihoods of the Nepalese population.

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