Export of Rubber mulch

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Part 1

Product Information

Introduction

Fig.1 *The rubber mulch (Rymar, 2016)*

Rubber mulch is a simple product that can be produced from any durable rubber, shown in figure 1. It can be made using new rubber, or can be created by grinding up used and recycled conveyor belts, auto belts, or tires. Mulch created from used tires creates a durable, long lasting product that can replace traditional organic varieties, such as a wood mulch. Rubber mulch provides many benefits to both the consumer and the environment and is a quickly growing market with lots of potential. Rubber Mulch can be exported from Canada, a place with lots of cars and trucks as a continuous source of used tires. The mulch can be imported by Nepal for use in the large agricultural industry, which plays a key role in Nepal's economy. The benefits, and downsides of exporting large amounts of rubber mulch from Canada to Nepal will be analyzed, as well as additional, more feasible circumstances for importation into Nepal.

About Rymar and Rubber Mulch

Fig. 2. *The Rymar Logo (1Rymar, 2016)*

Rymar (fig. 2) is a Canadian company that is nation wide which specializes in rubber flooring products, synthetic golf turf, synthetic grass and ice rink boards, as well as being a large producer of rubber mulch (1Rymar, 2016). They have 2 corporate head offices, located in Calgary, Alberta and Mississauga, Ontario and additional offices in Vancouver, BC and Ottawa, Ontario (1Rymar, 2016). The rubber mulch is composed of new or used tire rubber that has been ground into 3/8 inch to ¾ inch pieces in a large machine that resembles a wood chipper (2Rymar, 2016). Rymar's rubber mulch is composed completely of used rubber auto and truck tires to try reduce the stockpiles of used tires in Canada (2Rymar, 2016). The tires are mulched using their own equipment at each location, which includes a large

mulching machine equipped with powerful magnets and metal detectors to ensure the mulch is metal free (2Rymar, 2016). Having equipment located across Canada means that the raw material can be sourced from anywhere across the country. The mulch is also coated in a polyurethane coating that prevents the mulch pieces from adhering to each other, and prevents any chemical leaching from the rubber itself (2Rymar, 2016). This protective coating also makes the product animal-safe as it will not pass any harmful chemicals to the animals during contact (2Rymar, 2016) Tire Rubber is a durable material that will not splinter, compress or decompose like wood or other organic mulches (2Rymar, 2016). Rubber mulch is also more resistant to insect and mite infestation than organic mulches (2Rymar, 2016).

Other Competing Companies in Canada

There are several companies in Canada that also sell rubber mulches. Heffco Elastomers Inc., based out of Simcoe, Ontario produces rubber mulch, but is not a large enough company to deal with the demands of an international market (Heffco group, n.d.). The majority of the companies that sell rubber mulch in Canada, produce the product in the United States of America. Crumb Rubber Manufacturers, a company with a location in Brantford, Ontario, has several other locations in the United States of America (Crumb Rubber Manufacturers (CRM), n.d.), and would likely start international trade from the United States instead of Canada.

Inputs and Cost of Production

The cost of the rubber mulch from Rymar reflects that fact that they do both processing and wholesaling. The elimination of a third party keeps costs lower for consumers. The main sources of cost in Canada is labour, raw material and fuel and equipment. The machines require operators to transport, grind, coat and package the product and materials. Raw material cost is reduced due to the fact they are recycling used tires for the mulch, keeping them out of dumps and landfills, as using new rubber would be much more expensive. There is a small demand for used tires, with some being used for retaining walls or as weights on livestock feed bunk-style silos or recycled into various rubber products. All of the equipment required runs on fuel, and requires maintenance, repairs and replacement due to wear and tear from working with a material that is designed to be durable and long lasting. All of these factors contribute to the main cost of production of the rubber mulch.

Patent Constraints

There is currently no patent in Canada on rubber mulch. (Canadian Intellectual Property Office, 2016). Any company can start producing rubber mulch in Canada without penalty.

Market Opportunity Evaluation

There is a very large market opportunity for the export of rubber mulch to Nepal. Any farmer or gardener in Nepal could use this product in some way. Agriculture provides income for 70% of the population in Nepal (Central Intelligence Agency (CIA), 2016), so there is a large

market opportunity. Nepal has 42, 400 km^2 of designated agricultural land, and 22, 200 km^2 of that is arable land (Central Intelligence Agency (CIA), 2016). This is a large amount of land that could be utilizing rubber mulch in various ways. The main target consumer would be farmers with fields and orchards. Secondary target consumers would be livestock producers. Another, separate target consumer could be in the infrastructure industry, as the use of rubber mulch on pathways and roadways could prevent these areas from becoming very muddy and difficult to travel on during the wet season, especially in the rural areas.

Economic Benefits to Canada

Canada would receive several benefits from the export of rubber mulch to Nepal. Canada would receive economic growth due to the income created by exporting this product. Canada and Nepal could also create a strong trade partnership once a transportation route is established through the shipping of this product. Nepal exports several products that Canadians consume such as pulses, carpets, textiles, juice, and jute goods (Central Intelligence Agency (CIA), 2016), and is better climatically suited to grow certain products then Canada is. Almost 10% of current exports go to the united states (Central Intelligence Agency (CIA), 2016), so transportation to Canada would not be hard to achieve. Canadian retailers could import these products at a low cost due to a favourable exchange rate between Canada and Nepal, one Canadian dollar being worth almost 82 Nepalese rupees (The Money Converter, 2016). This importation and reselling would create an increase in profits for Canadian companies on already consumed products. A stronger trade partnership could also help Nepal by exporting to them products which they do not have the technology or resources to mass produce. Sharing Canadian technology and products that could help them improve their environment, infrastructure, and education to improve the overall quality of life and help to reduce poverty in Nepal could also be provided by a stronger trade partnership.

Environmental Benefits to Canada

Canada's environment would be improved by the export of rubber mulch to Nepal. Although there may be negative impacts on the environment due to the exhaust from the machinery used for production, the benefits far outweigh this negative and more environmentally friendly equipment and machinery could be created. There are 28 million used tires disposed of in Canada every year, that roughly equals out to 219, 000 tonnes of rubber (Morawski, 2001).

Tires deposited in landfills tend to "float" to the surface as the landfill shifts over time due to decomposition and environmental factors like rainfall levels (Walters Forensic Engineering, n.d.). For this reason, used tires are stockpiled in large quantities to be left for years, shown in Figure 3 (Walters Forensic Engineering, n.d.). Large stockpiles of used tires can cause many environmental problems for the local environment.

Fig 3. *A large stockpile of used tires (CBC)*

Mosquitoes are small insects that tend to breed around still water as they prefer to deposit their eggs in stagnant waters to hatch (Illinois EPA, 2016). Mosquitoes have a short lifespan and reproduce very quickly, laying up to 200 eggs at a time (Illinois EPA, 2016). Not only are mosquitoes an irritating pest, they can transmit diseases like the west nile virus and other blood-borne diseases, to many animals, be it a pet, livestock or a human (Illinois EPA, 2016). This can be a big issue when dealing with wildlife, as wildlife is difficult to vaccinate, producing more hosts of the disease for mosquitos to contract. Mosquito control is becoming very important as the impending threat of the Zika virus, which causes severe birth defects, becomes more serious as confirmed cases are spreading northward through the United States of America and is known to be spread by infected mosquitoes (Illinois EPA, 2016). The inside of the tire in a stockpile can become an excellent place for mosquitoes to breed and hatch as it is a small, undisturbed area, that has a cupped shape that can collect water from rainfall or snow melting (Illinois EPA, 2016). If the stockpiles of tires can be reduced, so can the number of mosquitoes and the incidences of the diseases they carry.

Tires are generally hard to combust, unless exposed to an open flame (Walters Forensic Engineering, n.d.). This is good news for the consumer of rubber mulch, as it is very unlikely that it will start a fire. Stockpiled tires were not thought to be a fire risk, until several fires were started by arsonists in these stockpiles all across the country (Walters Forensic Engineering, n.d.). The largest of these fires was in Hagersville, Ontario (Figure 4)and started on February 12, 1990. Arsonists lit a stockpile of approximately 10 million tires on fire, one of the largest stockpiles in the area (Morawski, 2001). This fire burned for 17 days, which cost the community and the environment greatly (Walters Forensic Engineering, n.d.). Several crews of firefighters were involved in controlling the fire, and their

Fig. 4 *Firefighters try to control the flames of The Hagersville Fire* (Hourigan)

wages were paid by the community through taxes. The environment was polluted by extremely high amounts of chemicals released by the combustion of the tires, part of the pollution was released into the atmosphere is thick, black smoke (Figure 5)and part of the environmental pollution was caused by the chemicals leaching into nearby surface water. This fire led Ontario to start the Ontario Tire Stewardship to promote recycling used tires and the popularity of products such as rubber mulch increased (Morawski, 2001).

Fig. 5 *The tire fire produced thick black smoke (Hourigan)*

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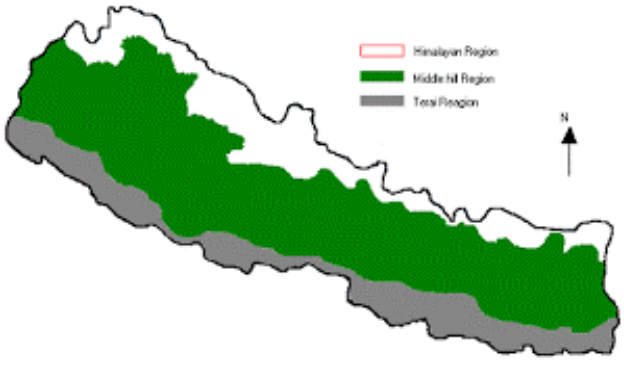
Part 2

Export Potential

About Nepal

Nepal is a landlocked country located in southern Asia, between China and India, with an area of approximately 147,181 square kilometers (Central Intelligence Agency (CIA), 2016). The country is divided into three regions, shown in figure 6. The most northern part of the country is located within the rugged Himalayan mountain range, with cool summers and severe, cold winters (Central Intelligence Agency (CIA), 2016). The most southern part of the country consists of flat river plains, known as the tarai, with subtropical summers and cool, mild winters (Central Intelligence Agency (CIA), 2016). The central region is primarily hilly areas, with a climate in between the north and the south. The economy is considered very poor and developing, with approximately one quarter of the population living below the



poverty line (Central Intelligence Agency (CIA), 2016).

Fig. 6 *Nepal is divided into 3 regions (Nepal)*

Nepal is largely dependant on agriculture. Agriculture provides an income for 70% of the population and occupies approximately 29% of the total land area. Arable land, suitable for growing crops, occupies approximately 15% of the total land area, which equals 22,200 km^2 (Central Intelligence Agency (CIA), 2016). Of the 22,200 km^2, 13,300 km^2 is irrigated (Central Intelligence Agency (CIA), 2016). Nepal had a gross domestic product (purchasing power parity) of $70.09 billion USD for 2015 (Central Intelligence Agency (CIA), 2016), in comparison, Canada had a gross domestic product (purchasing power parity) of $1.632 trillion USD in the same year (Central Intelligence Agency 2 (CIA), 2016).

Nepal has an estimated population of 29,033,414 (Central Intelligence Agency (CIA), 2016), only a slightly smaller country when compared to Canada's population at an estimated 35,362,905 (Central Intelligence Agency 2 (CIA), 2016). It is a very diverse country with 125 ethnic groups, and many local languages, although the official language is Nepali (Central Intelligence Agency (CIA), 2016).

Transportation to Nepal

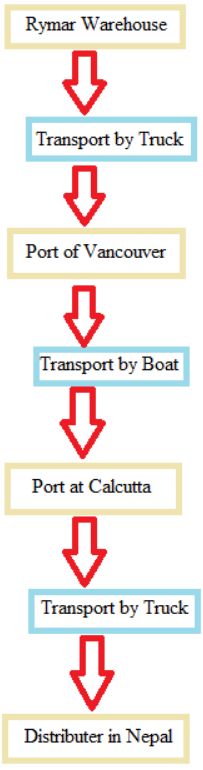


Fig. 7 *Transportation flowchart*

Transportation of the rubber mulch from Canada, across the Pacific Ocean, to landlocked Nepal is a major limiting factor of this export. When exporting to Nepal, the shipping cost will also be a large factor. The product is very heavy, and comes in large quantities, the mulch is packaged in 2000 pound units (3Rymar, 2016), that will take up a large amount of space and require a large amount of fuel to transport, especially if transported by aircraft. The two options for transportation across the ocean are by cargo ship or cargo plane. Shipping by plane would be much quicker then cargo ship (Fig. 7), and would get the product directly into Nepal, but it is not realistic to ship such a heavy product by plane. Shipping the mulch in bulk requires driving the product from the Rymar warehouse in Vancouver, BC, to the dock at the Port of Vancouver by truck. This is a very short distance, and could easily be done by Rymar themselves to minimize cost. At the Port of Vancouver, the product would be loaded onto a cargo ship to be transported to Calcutta, India. This would cost approximately $1,100 CDN (quoted at $800 USD) (Live Exchanges, 2016) (A1 Freight Forwarding, 2016). The product would then have to be loaded onto a transport truck, or loaded onto a train and driven to the desired distribution location in Nepal. Nepal has only 53 km of railway

(Central Intelligence Agency (CIA), 2016), so the product may have to be driven from the train station to the distributer by transport truck.

Storage

A major benefit of the rubber mulch is that it can be stored anywhere. It is not sensitive to heat, light, cold or water, as it is a product designed to be used outdoors (2Rymar, 2016). The only requirement would be to keep it away from open flames to prevent the ignition of a fire.

Cost Analysis for Profitability

This product would initially be expensive to a Nepalese farmer, but it is an investment that will last for up to five years (2Rymar, 2016). Each 2000-pound unit of rubber mulch is priced at $899 CDN, and will cover approximately 450 square feet of area (3Rymar, 2016). The shipping cost will also be a large factor in the cost for consumers. The final product is heavy, bulky and must be transported a far distance to reach Nepal from Canada which causes a high cost for shipping. The mulch is packaged in 2000 pound units (3Rymar, 2016), that will take up a large amount of space and require a large amount of energy to move. Shipping by cargo ship adds an additional $1,100 CDN alone (Live Exchanges, 2016) (A1 Freight Forwarding, 2016). Excluding the cost of transporting the product by truck, the total cost of the product once it reaches the distributors in Nepal is $1900 CDN, or $155,800 Nepali rupees per 2000-pound unit of rubber mulch. The cost to the farmers would be even greater than this because of the additional retail cost. The total cost to the farmer would also depend on the size of the farm they own, as they may not require such a large quantity.

The rubber mulch produced by Rymar is supposed to be maintenance free for approximately five years, as it does not decompose like wood, or other organic mulches (1Rymar, 2016). Rymar also states their product can save consumers up to 65% compared to wood mulch because of the long-lasting quality of their product (1Rymar, 2016).

How Will The Rubber Mulch Be Used In Nepal?

Rubber mulch can be applied to the exposed soil between row crops in fields, between plants in gardens, and between tree rows in orchards. Root crops such as potatoes, carrots, and radishes require soft soils (Sharma, 2016), as soil compaction can negatively affect the growth and quality of the product (Johansen, 2015). Using rubber mulch when growing these crops will help reduce soil compaction because tires are designed to absorb and withstand pressures, and to act as a cushion. (2Rymar, 2016). The rubber can also be helpful when dealing with irrigated crops, mulch helps retain water and prevent runoff (H. Kirnak, 2006). Rubber mulch does absorb water like wood mulch, so all of the irrigated water is going into the soils. Mulch also helps to suppress weed growth (Meyer, 1997), which could save the farmer money in labour costs and reduce herbicide costs, and increase crop quality. Soil erosion can also be controlled by covering exposed soils with mulch (Meyer, 1997).

It could also be used in animal housing areas to reduce mud around feeding and watering areas, as it has excellent drainage, compared to exposed dirt that may be compacted down due to heavy livestock such as cattle repeatedly standing on it. It will not compress under heavy weight, so drainage is never compromised (2Rymar, 2016), and the area can be easily cleaned using water, or by rain. It could also be used under, or as a replacement for animal bedding in barns because the drainage will help keep the animals away from urine and feces, and improve their overall health. Using rubber flooring has also been shown to improve reproductive health in cattle (Kremer, 2012).

Advantages and Disadvantages

There are several advantages to using rubber mulch. As mentioned above, using mulch helps to retain moisture, which is especially important when using irrigation (H. Kirnak, 2006). It helps to reduce soil erosion, soil compaction and weed growth (Meyer, 1997). These are all factors that affect crop production, and using much could help improve crop production, and therefore productivity and profits. Increasing profits could make this product worth the high cost overall. The mulch could be pushed aside during plowing and planting, but completely removing the product could be quite difficult as the individual pieces of mulch are quite small, less than 1 inch long (3Rymar, 2016). The product is easy to clean, as just water is needed to wash away any debris. The product is virtually maintenance free and very easy to maintain once applied.

Benefits to Nepal

Rubber mulch could provide several benefits to the people of Nepal. The sales of the product will increase the local economy and provide additional income to the distributors. The overall soil health of the fields would be improved due to reduced soil compaction (Meyer, 1997). Less irrigation would be required (H. Kirnak, 2006), so more fresh water would be available for livestock and human consumption. There would also be less mud if used in livestock housing, which would aid in keeping livestock clean, dry, and healthy. By suppressing weed growth, there would be a lesser need for the use of herbicides (Meyer, 1997), reducing the amount of chemicals required to be applied to the fields, helping to prevent herbicide resistance, and reducing the amount of exposure farmers have with chemicals.

Potential Importers and Distributors

Any farm supply company in Nepal could import and distribute the rubber mulch. A possible company to do so is Nepal Drip Irrigation P.Ldt.. This Company is a large farm supply company already established in Nepal (Nepal Drip Irrigation P.Ltd., 2016), and could easily accommodate to selling rubber mulch at its locations. Another option would be for large commercial farms to import the product directly to reduce costs by eliminating the third-party retailer. The Organic Farm Nepal is a large research and production farm that grows a wide variety of crops and livestock (Agriculture In Nepal, n.d.) and has the potential need for use a whole unit of the

mulch, or more. A third option would be for groups of farmers to combine together and import a unit of mulch and distribute it among themselves.

Marketing Strategy

The main marketing strategy is to convince farms that they would greatly benefit from the use of rubber mulch. Positives, such as increased yield potential in root crops, reduced weed growth and reduced use of irrigation would be the main selling points for targeting Nepalese farmers. Also, promoting the fact that the product is made from recycled material and is helping the environment would be important. The fact that rubber mulch would save the farmer more money compared to using organic mulch would be greatly emphasised. Rubber mulch is not widely used in agriculture in any country, so initial sales could be difficult, as results are not guaranteed. Once a few farmers had success with the product, sales would increase due to word-of-mouth promotions.

Import and Export Documentation Required

Only a few simple export documents are required, and can be produced by Rymar prior to shipping. An export declaration is required if shipping over $2000 CDN worth of product (Canada Border Servies Agency (CBSA), 2016). This form can be filled out online at any time, but must be completed 48 hours before the product is loaded onto the cargo ship (Canada Border Servies Agency (CBSA), 2016). The international system of identifying a product being shipped is the Harmonized System, which consists of a series of codes (Statistics Canada, 2015). The particular code for this product would be 4003.00.00 and refers to reclaimed rubber in primary form or in plate, sheets, or strips (Statistics Canada, 2015). Primary forms include blocks of irregular shape, lumps, bales, powder, granules, crumbs, and similar bulk forms (Statistics Canada, 2015), which would include mulched form.

The importation form requirements are more intensive. To import a product commercially, the same declaration form that was used to export the product is required, as well as an invoice, packing list, CTD for land route, a banking transaction document, a document of insurance, a country of origin certification, a VAT registration certificate, and a document detailing the delivery order (Department of customs (DOC), 2016). Rymar must also be registered with the government, and a company registration certificate must be included with the other importation documents (Department of customs (DOC), 2016).

Grant Programs for Initial Funding

The International Fund for Agricultural Development (IFAD) has given the Nepalese government $39 million USD to enhance sustainable agricultural growth (International Fund for Agricultural Development (IFAD), 2012). The previous funding focused on getting quality seeds

and breeding programs to farmers (International Fund for Agricultural Development (IFAD), 2012). Nepal could apply for additional funding to be allocated for importing rubber mulch and other products to help improve soil health.

The Bill and Melinda Gates Foundation has also donated to Nepal in the past to help alleviate the poverty farmers are in, and to help farmers produce more food to feed the country (Bill and Melinda Gates Foundation (BMGF), 2012). Nepal could appeal to the foundation for another donation to help cover the costs of importing the rubber mulch.

Global Competition

Currently, rubber mulch is not being used in the agricultural industry, so the first company to expand into this market will have a first-to-the-gate advantage, but will also have the difficult task of promoting the product effectively. There is a lot of global competition, as there are a lot of tires being used around the world. The United States produces a large number of used tires, has the means to produce rubber mulch, but is in a similar situation as Canada, as they also would have to ship across the ocean. China, India, and other large Asian countries are at an advantage compared to Canada and the United States of America. China had 279 million registered cars in 2015 (Xinhau, 2016), so they will have more then enough used tires being produced to meet the demands of rubber mulch.

Conclusion

There are a lot of benefits to Nepalese farmers when using rubber mulch in their fields, gardens, orchards, and livestock production. Rubber mulch helps to improve soil quality for root crops (Johansen, 2015), reduces the need for irrigation (H. Kirnak, 2006), suppresses the growth of weeds and helps to reduce erosion (Meyer, 1997). Canada may have a good supply of raw material to produce the rubber mulch, and the equipment required, but the high cost of shipping across the ocean is preventing this from becoming a realistic export. A closer, yet still industrialized country, like China, would have similar material, and equipment. China would be a more practical trade partner for this product due to the much lower shipping cost due to sharing a border with Nepal.

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