

Exporting Tillage Radishes to Nepal

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Part 1: Product Information

Product description:

Tillage Radish, is a seed planted for the use of a cover crop. A cover crop is a crop planted primarily to manage soil erosion, fertility, and quality, along with managing water levels, weeds, disease, and the biodiversity in an agroecosystem (Sustainable Agriculture Research & Education, 2012). Tillage Radishes is a fast growing all-natural cover crop. This variety of radishes are Daikon radishes. They form a thick, white taproot/ tuber that can reach lengths of 1-1.5 feet, most of which is grown underground (Cornell University, 2009). Smaller extensions or secondary roots can grow an additional 14 inches easily breaking up deeper levels of compactions. Tillage radishes can exert 290 pounds per square inch when rooting down, allowing them to easily break through levels of hardpan (Cornell University, 2009). This crop is not winter hardy, and therefore the plant will begin to rot once the temperature exceeds -9 degrees Celsius (Annex Business, 2015). The plant then dies off over the winter. As they decompose into the soil, the pores left behind act as deep channels, resulting in good air movement and a shorter drying period in the spring (Cornell University, 2009). The taproot also allows the plant to access important minerals and nutrients that are inaccessible to shallower growing crops (Annex Business, 2015). As long as the radishes are left to decompose until spring, the tubers will release the stored nutrients back into the soil, and roots of subsequent crops. These minerals include nitrogen, potassium, and calcium (Speare Seeds, 2015). The decomposition of this crop leaves behind a very pungent natural gas smell. These chemicals released by the radish help rebalance the microbes of the soil, encouraging plant health (Annex Business, 2015). Above ground the crop develops into a wide leaved top, rich with additional nutrients. This dense foliage grows quickly, covering an area of 12 inches x 12 inches which

greatly reduces fall weed populations, and effectively outcompetes winter weed control. Some additional pest management suggests that radishes decrease the population of wireworms in potatoes, and protects canola from clubroot (Annex Business, 2015).

Obtaining and Processing the Product:

Speare Seeds in partnership with Cover Crop Solutions is a Canadian ran company for the past 40 years, and is the supplier to many dealers across Canada. Its main operation is located in Harriston Ontario (Speare Seeds, 2015). This company produces its product from harvesting the previous year's crop. Tillage radishes are usually planted in late summer, early fall, if strictly used for cover crop purposes (Annex Business, 2015). However, when planning on harvesting the seed, to be used as viable seed for the following season, the crop should be planted after wheat harvest. This gives the crop enough time to develop a seed pod, before the first frost. Once the crop has developed a mature seed pod, it's time for harvesting. Tillage radishes are harvested with the latest technology of a flexdraper head (MacDon Industries, 2015). This is very similar to a wheat and bean head, however the flexdraper maintains a consistent small critical gap between the reel fingers and cutter bar, resulting in less seed loss (MacDon Industries, 2015). Similar to canola, radish seed is very small, making it important to cut close to the ground. Once harvested, the seed is brought to the warehouse, sorted, and treated appropriately. Seed can then be put into bags and containers, and sold as is, or mixed in with grasses and other over crop and sold as a tillage radish mix (Speare Seeds, 2015). This product is then shipped all over Canada for the distribution to all the dealers, where it is then distributed further to the customers for use in the field.





<http://1.bp.blogspot.com/>

<http://www.permies.com/>



<http://www.sundmfg.com/images/beans.jpg>

Application of the Product:

Most of the Agriculture done in Nepal is done by subsistence farmers. Subsistence farmers come from low income, and have less access to advanced technology and equipment than we do in Canada (Calkins. P.H, 1982). Without large planters like we have in North America, farmers would have to plant the seed by hand. There are two different methods of doing this, broadcasting or precision planting (Speare Seeds, 2015). Broadcasting consists of randomly throwing or spreading seed throughout the field. For quickest germination results the ground should be tilled and the soil should be moist (Great Plains, 2015). When broadcasting, the seed should be spread at 8lbs/acre (Speare Seeds, 2015). Precision planting is when the farmer carefully plants the crop in rows. For highest yields, the crop should be planted in 15 inch rows and 4 inch in-row spacing (Great Plains, 2015). Seed should be planted at about 4lbs/ acre (Speare Seeds, 2015). This technique is more profitably as the crop has more benefit grown at the recommended spacing. In the hill regions of Nepal, the seed may be more prone to leaching if the conditions are not immediately ideal for germination. With the slope of the hills, rainwater may carry the seed away from the fields (USAID, 2015). The crop can be planted any time after June 20th. For ideal crop production, the crop should be planted no later than 40-60 days before the first killing crop (Sustainable Agriculture Research & Education, 2012).

Benefits to Canada:

The sales of Tillage radishes to Nepal will not only benefit Nepal, but will also benefit Canada as a whole. The sales from the seed will benefit the Canadian market, by funneling money back into a Canadian based company. This in turn will put money back into the economy, and/or potentially fund more research for better improved seed. This will allow Speare Seeds to expand their company and produce seed at a higher level. This product will benefit local Canadians as it is manufactured and produced from Canada (Speare Seeds, 2015). This will employ Canadian people, which will also introduce money into our economy. This variety of seed might not be of high demand, however other seed provided from this company is. Seed is very sustainable, due to the fact that there will always be a need for seed around the world, this will allow for a steady export of seed to other countries. The revenue that would come from these exports to Canada might not make a substantial profit for the company, however it will provide networking. This networking will advertise the products they produce to other countries, potentially increasing the interest of the company which hopefully lead to an increase in sales. The advertisement form this product will increase Canadas trade opportunities. As of 2013 Canadas largest trading partners included the United States, China, Mexico, Germany, Japan, and the United Kingdom (CIA World Factbook, 2013).

As Nepal increases their knowledge on the cover crop benefits, it will help them to become more efficient producers of food. The more efficient they become, the more their economy will grow. This will benefit Canada because it will open new doors for other trading opportunities. It will be many years of improvement and new knowledge for the Nepalese, but it will create an economy that will become a more suitable and sustainable trading partner for Canada.

Cost of the Product:

There are many Canadian suppliers of cover crops, however Speare Seeds is a company that specializes in tillage radishes and has the lowest Canadian rates. The seed is available in various size depending on the farmer's request. Speare provides 10lb and 50lb bags at a rate of \$3.15/lb (Elmy, K, 2015). They are also one of the few Canadian companies that provide bulk orders. This would probably be the most cost efficient and practical for Nepalese farmers. This company sells bulk at a rate of \$2.78 -\$3.10/lb depending on the selected mix (Elmy, K, 2015). Bulk orders would be easily transportable and distributed to farmers, once in Nepal. These are set prices and don't include tax, therefore adding an additional 13% for the Canadian tax dollar. Nepal also has many incoming taxes, as the border taxes account for almost 50% of their total tax revenue (Government of Nepal, 2015). Additional costs would be added to the total, once transportation and handling costs have been determined.

Part II: Export Potential to Nepal

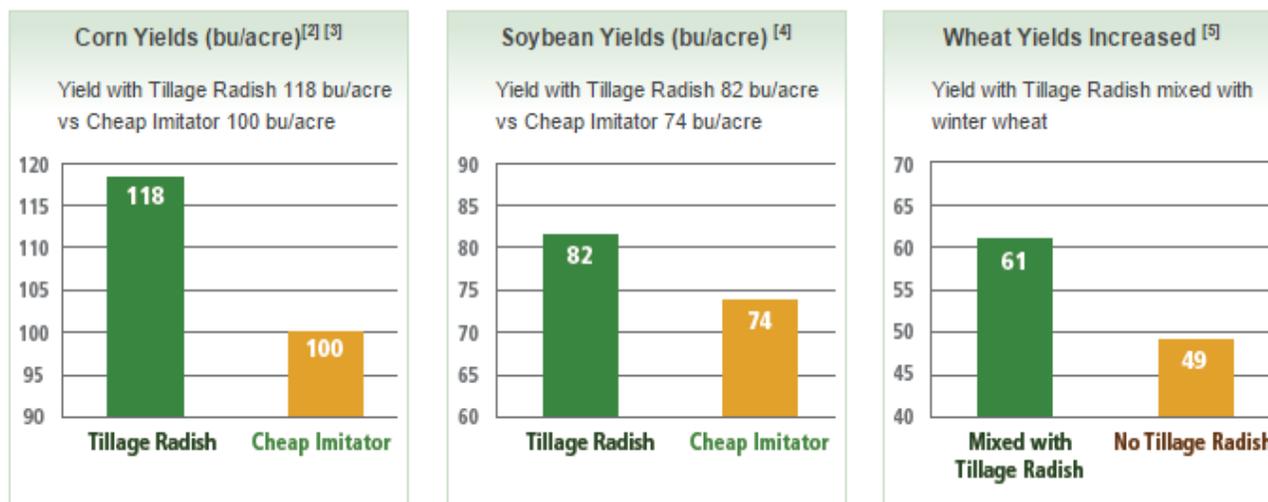
Introduction to Agriculture in Nepal:

Nepal is a small country located in Southeast Asia in between China and India (Nepal Tourism Board, 2012). It has a total land area of 147,181 square kilometers and a population of roughly 27 million people (Nepal Tourism Board, 2012). Approximately 70% of the total population is employed in agriculture, accounting for 38% of the overall GDP (USAID, 2015). Even with these numbers, Nepal struggles to produce enough food and profit to feed its growing populations (USAID, 2014). Just over 50 percent of the Nepalese population is malnourished, with nearly half of the children under five chronically malnourished (USAID, 2015). Farmers of Nepal are subsistence farmers, producing barely enough food to feed their growing families (Calkins, 1982).

Benefits to Nepal:

Tillage radishes will mostly benefit Nepal based on the significant increase in yields. Tillage radishes is one of the few cover crops with certified testing that directly proves yield increase. Research shows a yield increase of up to 10% in corn, 11% in soybeans, and 5-8b/a in winter wheat of crops planted into decomposing tillage radish soil. (Speare Seeds, 2015). Below, figure 1 clearly illustrates these results. Most farmers in Nepal are subsistence farmers, growing just enough food to feed their family (Calkins, 1982). If all of the farmers of Nepal experienced an increase in yield, they might be left with more food than is needed to feed their family. Once this begins to happen, farmers will be able to sell their excess product to make a profit. This means that they can use this profit to buy equipment, and improved technology that they did not previously have, to make their life easier. The extra money made from the higher crop yields would allow the people of Nepal to thrive with a better lifestyle.

Figure 1:



Since 75% of the farmers in Nepal are subsistence farmers, the extra money made from the higher crop yields is of concern to most farmers (Nepal Tourism Board, 2012). Cover crops in general are known to help prevent erosion, and keep soil levels stable. Tillage radishes are especially known for this

characteristic, due to the size and growing depth of their taproot (Sustainable Agriculture Research & Education, 2012). These results are significant, and could truly help with soil management practices of Nepal. Soil manage practices directly relate to mineral levels within the soil. Since this variety has the ability to store minerals over the off season, it will greatly cut back on fertilizer costs for the following planting season.

This mix would also allow farmers to use the fields as grazing pastures for livestock. This radish is very digestible and provides many nutrients and minerals keeping a balanced diet (Speare Seeds, 2015). There are a variety of radish mixes available, always including a grass species. Tillage radish seed needs a chance to establish before livestock is introduced. It is ideal to have the mix grown for 2-3 weeks before, and then have the grass grazed low, prior to the next planting season (OMAFRA, 2015).

Health Benefits:

Aside from the previous benefits, tillage radishes can provide many nutritional health assists. The root of the radish has a very plain bitter taste, and is a nutritional vegetable rich with vitamin C and iron (Rudrappa. U, 2009). Vitamin C is a water- soluble that aids in the synthesis of collagen. This is the main vitamin that helps fight off infection and boost the immune system (Rudrappa. U, 2009). This will benefit the people of Nepal, by introducing additional foods, improving their daily meals. Similar to spinach, tillage radishes have a bitter taste, and are often used in salads or mixed with vegetables (Rudrappa. U, 2009).

Transportation:

After being processed, the seed can be transported from Speare Seeds, Harriston Ontario, by truck to Toronto. From there it can be put on a boat and shipped to India through A1 Freight

Marketing Tillage Radish in Nepal:

When evaluating the market for tillage Radishes, it is unrealistic for the Nepalese people/farmers to invest in it. This is due to the realization that the average Nepalese person's yearly income was only \$1500, as of 2013 (CIA World Factbook, 2013). This product would be more suitable for different group organizations and cooperatives to invest in. The seed could be sold by distributors in Nepal, as they already do with other crops. The cooperatives would be able to buy tillage radishes in bulk, and have better facilities than farmers to store the seed. This would ensure that farmers only purchase the amounts of seed needed, cutting back on waste, and expenses. The distributors would be able to sell seed as needed, or they could possibly put together smaller bags to be sold at reasonable prices. Farmers would not get stuck with excess amounts of seed. If the seed was put in smaller containers or bags, the farmers could also store the excess, as long as they kept the seed undercover, away from wet or damp weather conditions.

Product Competition:

There are several companies worldwide that provide cover crops. Tillage Radishes is a unique variety and was introduced into Canada in the early 2000's. As a Canadian provided seed, this product won't be too competitive for Speare Seeds. Speare Seeds is a company that specializes in tillage radishes and has the lowest Canadian rates (Speare Seeds, 2015). However if this product were to be exported from Asia, where this product was first introduced, the market could become very competitive.

Financial assistance:

The Canadian Trade Commissioner Service (TCS) in Nepal is designed to provide practical advice with the Nepal market to help make better, more efficient and cost-effective

decisions. Canada doesn't have a free trade agreement with Nepal which means that tariffs would be put in place on the seed prior to being sent over. Therefore, this process would increase the overall cost of the product (International Gov't, 2015). Speare Seeds offers a financial program that allows farmers to pay a percentage of the overall cost per month. This allows to budget their monthly farming costs, extending the cost over a reasonable amount of time (Speare Seeds, 2015).

Summary:

Canada would benefit greatly from the export of Tillage Radishes to Nepal. The Agriculture sector of crop science already employs many Canadians, and a greater demand for these products would only increase this industry and expand the Canadian economy. Nepal would benefit from the import of a cover crop, as it would help with soil management and increase crop yields. The excess of crops would help Nepalese farmers feed their growing families, and help with additional income. There will be some difficulty with the export to Nepal. Cost plays a major factor, as the product its self is already a large expense. The distribution of the seed to local farmers is an additional process which will take more time and handling. The storage of the product won't be the easiest for the Nepalese farmers, as seed must be kept out of wet or damp weather conditions. The people of Nepal do not have facilities to store the seed inside to keep it dry.

References:

A1 Freight Forwarding Inc. (2015). Freight Shipping & Cargo Shipping by Country. Retrieved November 29, 2015, from: <http://www.a1freightforwarding.com/>

Annex Business.(2015). Tillage radishes – a new option for improved soil health. Retrieved November 29, 2015, from <https://www.agannex.com/energy/tillage-radishes---a-new-option-for-improved-soil-health>

Calkins, P. H. (1982). Why development fails: The evaluation gap in Nepal's subsistence agriculture. *World Development*, 10, 397.

CIA World Factbook. (2013). Labor force - by occupation. Retrieved November 28, 2015, from <https://www.cia.gov/library/publications/the-world-factbook/fields/2048.html>

Cornell University. (2009). Forage radish. Retrieved November 29, 2015, from <http://covercrops.cals.cornell.edu/forage-radish.php>

Elmy, K (2015) Personal communication by phone (519-338-3840). Date: Nov, 20 2014. K.Elmy is the Business Manager at Speare Seeds.

Government of Nepal. (2015). Communication: Sharing information for better Cooperation. Retrieved November 28, 2015, from <http://www.customs.gov.np/en/>

Great Plains Manufacturing, Inc. (2015). Cover Crop Seeding Methods. Retrieved November 28, 2015, from <http://www.greatplainsag.com/en/cover-crops/10083/cover-crop-seeding-methods>

International Government of Canada. (2013, May 13). Doing Business with Nepal. Retrieved November 29, 2015, from http://www.canadainternational.gc.ca/india-inde/commerce_international/Nepal.aspx?lang=eng

MacDon Industries Ltd. (2015). FD75 FlexDraper® Headers for Combine | Products | MacDon. Retrieved November 29, 2015, from <http://www.macdon.com/products/fd75-flexdraper-headers-for-combine>

Nepal Tourism Board. (2012). Know Nepal: Geography. Retrieved November 28, 2015, from <http://welcomenepal.com/promotional/know-nepal/geography/>

OMAFRA. (April 24, 2012). Cover Crop: Oilseed Radishes. Retrieved November 28, 2015, from http://www.omafra.gov.on.ca/english/crops/facts/cover_crops01/oil_radish.htm

Rudrappa, U.(2009) Radish nutrition facts and health benefits. Retrieved November 29, 2015 from <http://www.nutrition-and-you.com/radish.html>

Speare Seeds. (2015). Cover Crop Radishes. Retrieved November 28, 2015, from http://www.speareseeds.ca/index.php?p=Tillage_Radish

Sustainable Agriculture Research and Education. (2012). Benefits of Cover Crops. Retrieved November 28, 2015, from <http://www.sare.org/Learning-Center/Books/Managing-Cover-Crops-Profitably-3rd-Edition/Text-Version/Benefits-of-Cover-Crops>

USAID. (2015). Agriculture and Food Security. Retrieved November 28, 2015, from <https://www.usaid.gov/nepal/agriculture-and-food-security>