Potential Canadian Export of Fulvic Acid to Nepal to Help Their Agricultural Sector

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Introduction

Fulvic acid is an organic fertilizer derived from a complex mix of hydrocarboxylic acid that has phenolic hydroxyl groups attached (Yang et al, 2014). It is a crucial component of organic matter (Aminifad et al., 2012). Recently, research has been conducted on fulvic acid's effect of humans, plants and soils with positive results. Examples of the observed benefits include increased nutrient uptake, increased root growth and reduced soil acidity (Yang et al., 2014; Plant Products, 2014). The product being researched is "EZ-Gro 0-0-3 Fulvic acid 70%" by Ontario-based company EZ-Gro and distributed by Plant Products Inc. in Leamington, ON.

This report outlines an export opportunity of fulvic acid fertilizer from a Canadian company to Nepali farmers. This exported fertilizer will produce a larger plant that is able to absorb more nutrients for the Nepalese farmers. This product will help farmers in the terai and hill region of Nepal increase their crop yield.

Part 1: Product Information

Product description

Plant Products Inc. is an Ontario-based agricultural distributing company that carries a product called "EZ-Gro 0-0-3 Fulvic acid 70%". This is a water-soluble fertilizer that can be found using the item number 3695 on the Plant Products webpage (Plant Products, 2014). The product is manufactured in Kingston, ON at Agrowchem Inc. manufacturers. Plant Products Inc. has two branches in Ontario, one in Leamington and the other in Ancaster. Across the two branches they employ 28 people. (Plant Products, 2014). The company that is responsible for creating the product, EZ-Gro, is based out of Kingston, ON. For more information about the product itself, the contact information for both Plant Product Inc. and Ez-Gro are listed below.

Contact information for Plant Products.

Head Office

50 Hazelton St.
Leamington, ON, Canada
N8H 3W1
Phone: (519) 326 9037
Email: **ordersplantproducts**.com

Contact information for Ez-Gro.

Head Office

605 Justus Dr.
Kingston, ON, Canada
Phone: (877) 544 4769
Email: info@ez-gro.com

Fulvic acid

Fulvic acid can be manufactured as a powder or a liquid. The powder can be applied to the leaves for a foliar application or directly on to its roots in solution (Plant Products, Inc.). Both methods have their own advantages. In addition to the benefits mentioned before, fulvic acid advantages include; a reduction in soil acidity, an increased intake of oxygen and chlorophyll and a larger nutrient absorption (Yang et al., 2014). Fulvic acid must be applied more than once for most crops. The label on the product outlines how to apply the fertilizer for different crops. The crops most commonly grown in Nepal are outlined below in Table 1 along with information on how to apply the fertilizer. Data from table 1 retrieved from Ez-Gro fulvic acid 0-0-3 70% label.

Crop	**First Application**	**Second Application**	**Third Application**	**Optional**
Corn	Six-leaf stage	55-75 cm growth	Just prior to tasseling	
Pulses	Six-leaf stage	First bloom	First pods	
Potatoes	Six-leaf stage	When the tuber is approx. Pea size	Early bloom	Bulking up
Oilseed crops	Before reproductive growth stage	At flowering height	Every 4 weeks	

Table 1: applications of fulvic acid for the most popular crops in Nepal.
Source: (Ez-Gro, 2016)

The plants chosen for the table are of the most popular crops grown in Nepal (Sharma, 2001). The two options for application are foliar and root/drip irrigation as mentioned above (Ez-Gro, 2016). Foliar means it will be applied directly onto the leaves in a solution. The recommended amount is 0.5 to 2 kg per hectare of crop land (Ez-Gro, 2016). A root application or “drip irrigation” method usually requires more equipment to drip the fertilizer directly into the root system. However, since Nepal is a third world country, it would be less possible for the farmers to acquire this type of technology. The foliar application would be more labor intensive

but more cost effective since it would require spraying a solution of the fulvic acid on each plant but no advanced technology.

Since the product is only sold in bulk bags of 25 kgs, the best way to cut down on cost would be to divide the bags and share amongst farms. Most farms in Nepal are either 1 hectare or smaller, therefore for one season they would need a maximum of 12 kg for a large farm growing oilseed crops. For other farms they would only need a maximum of 6-8 kg. If a number of farmers got together to split the price, it would become much more affordable. The upfront cost of $250.32 Canadian dollars for the Nepalese would be far too expensive, therefore ways of lowering that cost must be utilized.

There are many areas of agriculture that can be improved with the use of fulvic acid as a fertilizer. First, in ecological regions of Nepal with acidic soil, fulvic acid can be applied to reduce the acidity because of its buffering properties (Yang et al., 2014). By helping to improve the soil, the fulvic acid will increase crop yields. Furthermore, fulvic acid is a chelating agent (Plant Products, 2014). The added benefits of a chelating agent include adding and holding on to more micronutrients in the soil for the plant (Edwards et al., 2016).

Benefits to Canada

Ez-Gro is the company that produces Fulvic acid 0-0-3 70%. Their main office is located in Kingston, ON. Ez-Gro are in partnership with many other Canadian distributors. For this export, Plants Products Inc. is the distributor used. Their head office is in Leamington, ON with three other offices in Canada and one in U.S.A. They employ 28 workers in the two Ontario branches. Indirect benefits include, jobs created in the transport industry and increase in profits. The company chosen to do the ground transport from Ontario to British Colombia will have more clients and there for make more profit. Since all of the producers, manufacturers, distributors and transport companies are Canadian based, this export will be creating jobs, increasing profit and providing a better economy.

Part 2: Export potential to Nepal

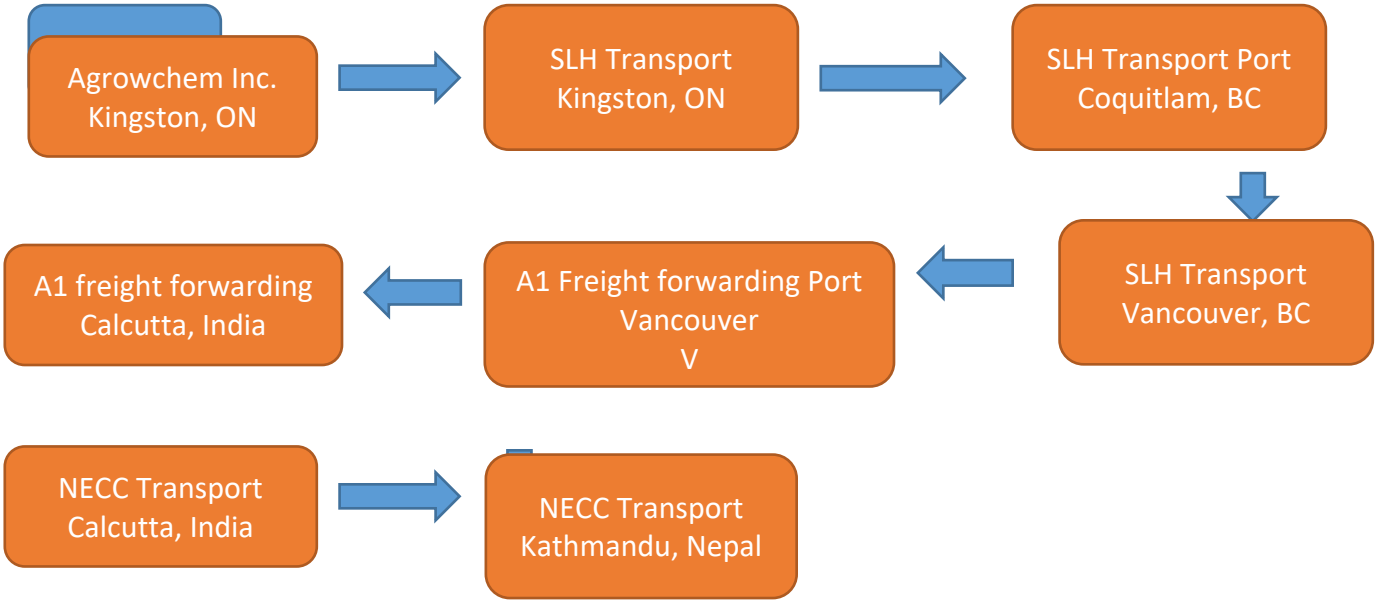
Introduction to Nepal

Nepal is a small country in Asia located between China and India. The population is approximately 29 million people (Central Intelligence Agency [CIA], 2016). Nepal's total land mass is 143,351 km^2 with 29% of that land being used for agricultural purposes (CIA, 2016). There are three major ecological regions in Nepal that define what is able to grow there; mountain region, hill region and terai region (Aryal et al., 2013). The farmers in the mountain region have a difficult time growing enough food for the people residing there since there is a limited growing season and the low temperatures make growing certain crops impossible (Chapagain et al., 2016). Farming in the hill region relies on terrace farming methods. This method reduces soil erosion (Tiwari et al., 2008). The terai region in the lower part of Nepal provides the best land for farming. In this region, there is more fertile soils and flat, available land (Chapagain et al., 2016).

Recently, the quality and fertility of the soil found in the hill region of Nepal has been subpar and is continuing in with a negative trend (Pilbeam et al., 2005). Since soil can be seen as the backbone of agriculture, when crops are grown in poor soils, the yields reflect it. Currently, Nepali farmers are mainly use Nitrogen, Potassium and Phosphorus fertilizers or organic compost with some success in the hill region (Devkota et al., 2016). Devkota et al. (2016) also believe that is the Nepali farmers were to up their fertilizer use, the soil quality would greatly improve.

Transportation

Firstly, the fulvic acid will be manufactured at Agrowchem Inc. in Kingston, ON (Ez-Gro, 2016). Once it has been manufactured, it will be loaded on to a transport truck from SLH transport, which also has a terminal in Kingston, ON. (SLH, 2012). The truck will drive all the way out to Vancouver, BC**.** Once in Vancouver, BC., the shipment will be placed on an ocean freight and will sail to Calcutta, India (A1 Freight Forwarding, 2016). The fulvic acid will then be packed onto a North Eastern Carrying Co-operation (NECC) transport truck to travel from India, across the border to Kathmandu, Nepal (North Eastern Carrying Co-operation [NECC], 2016). From Kathmandu, the fertilizer will be distributed to smaller villages and farms. This will be done through Luna Nepal Chemicals and Fertilizers Co. Ltd.



Cost analysis to achieve profitability

The transportation and retail price combined make this product an expensive importation for Nepal. One 25 kg bag of fulvic acid costs $250.32 Canadian dollars (Plant Products, personal communications, October 17, 2016). If the first shipment were to start small, the number of bags could be just 100 in the initial export. This would put the upfront cost at $25,032 Canadian dollars. The cost of the ocean freight would be $4,600 CAD (A1 Freight Forwarding, 2016). The

cost of the transportation is Canada was not disclosed therefore an accurate estimate cannot be made for total cost. When the cost of transportation is factored in, the cost of a 25 kg bag of fulvic acid could be put conservatively at $300.00 Canadian dollars. Once the on ground, transport costs are factored in, the price could dramatically increase.

Canadian grant ideas

To bring down the cost of this product, government grants and loans could be utilized. Institutes such as the International Fund for Agricultural Development (IFAD). The IFAD is focused on removing poverty and hunger from rural communities in third world countries. The idea is to provide grants, loans, and support to innovative ideas intended to help these less fortunate people. The innovations they are looking for are centered around agriculture and other divisions of agriculture such as fisheries and livestock. According to the International Fund for Agriculture [IFAD], (2016b) website, recipients of grants must be organizations with projects or initiatives focused on improving the lives of rural farmers. The grant amount is set as 10% of the loan received.

The Agriculture and Agri-Food Canada is a sector of the Canadian government that provides an Agri-Food Trade service that assists with exports of agricultural products (Government of Canada, 2016a). They provide insight in to the market as well as financial assistance where necessary. Getting approval from an organization such as this one would greatly boost the possibility of a successful export.

Documentation required for transport

The fertilizer is regulated under the Canadian Food Inspection Agency (CFIA) which is a division of the Canadian government (Government of Canada, 2014). All labeling of imports and exports is carefully done under this agency. They ensure all necessary information in documented for safe and effective use. This will help the people of Nepal properly use this item.

Benefits to Nepal

Fulvic acid will provide both agricultural and economic benefits to the people of Nepal. Both by improving crop and soil quality as well as creating jobs in distribution and sales, fulvic acid will be a great asset. For example, once the fertilizer has arrived in Kathmandu, Nepal, it will require a Nepali company to distribute and sell the product. One potentially company is Luna Nepal Chemicals and Fertilizers (P.) Ltd. They are located in Kathmandu.

Luna Nepal Chemicals and Fertilizers
Phone: +977-1-4419703
Email: lunanepal@wlink.com.np

Luna Nepal Chemicals and fertilizers could be in charge of distributing and selling the fulvic acid to local farmers, villages or small independent local stores. This would create more jobs in the sales and transport departments and help local businesses expand. The other aspect fulvic acid would improve is the soil quality and crop yields in the hill region. The soils in the hill region of Nepal have been declining in quality over the last years (Pilbeam et al., 2005). Fulvic acid will act as a buffer in the soil in order to reduce acidity (Yang et al., 2014). Another way fulvic acid will help the soil is by being a chelating agent. This gives fulvic acid the ability to supply plants will micronutrients that the soil may be lacking. All in all, fulvic acid will be incredibly beneficially to the agricultural sector of Nepal.

Competition

Fulvic acid is not as widely used as the primary fertilizers nitrogen, potassium, and phosphorus are. However, it is gaining popularity which means there are several companies competing for clients. Outlined in the chart below are competing companies in both Canada and around the world.

Company	**Product Name**	**Price (CAD)**	**Price per kg (CAD)**	**Location**
Plant Products	Ez-Gro Fulvic Acid 0-0-3 70%	$250.32/ 25 kg	$10.01/ kg	Leamington, ON
Xian Citymax Agrochemical Co., Ltd.	Super Fulvic acid liquid fertilizer	$1350-2700/ Ton	$1.50-3.00/ kg	Shaanxi, China
Down to Earth	Down to Earth Granular Humic Acid Fertilizer	$59.33/ 25 lbs	$5.23/kg	Eugene, Oregon U.S.A.

Figure 3: products around the world that are similar to the effects of fulvic acid
Sources: (Alibaba, 2016; Down to Earth, 2016; Directory of Nepal, n.d.; Amazon, 2016)

Plant Product's fulvic acid is the most expensive as well as extremely far away from Nepal. Both these factors make a fulvic acid fertilizer from Canada not the most favoured option. The humic acid that the American company Down to Earth is selling is a cheaper option with very similar benefits as fulvic acid. The Chinese company Xian Citymax Agrochemical Co. Ltd, offers a liquid version of fulvic acid. Since the minimum order from the Alibaba website is 1 ton for the liquid fulvic acid, the best option would be for a small village or a number of farmers to gather together in order to purchase the fulvic acid as a combined community. This way, the cost would be reduced dramatically and more farmers would be able to have access to this new system of innovation. All of these options have their advantages and disadvantages.

Restraints

Many export ideas have many barriers that need to be crossed in order to set up a successful business. For fulvic acid the barriers include cost and getting quotes for cost.

The transport companies were not willing to disclose prices without real commercial business intent. This barrier could easily be crossed if this export idea stops being a theoretical idea and is put in to motion in real life.

The cost of the fulvic acid fertilizer from Plant Products is still expensive for farmers in Nepal even with grants and such. There are several ways to get around this. Hopefully if all cost reducing methods are implicated the price will fall down to an acceptable range.

Conclusion

To conclude, a fulvic acid export from Canada to Nepal would benefit both Canadian companies as well as farmers and the general population of Nepal. Although the upfront price of $250.32 Canadian dollars is quite high for a developing country such as Nepal, the positive impacts fulvic acid could have on the agricultural sector would outweigh the negatives. To add to the effects on crop yields, fulvic acid imports would also help create jobs in Nepal for those selling, distributing and transporting the fertilizer. This nutrient absorbing, growth inducing, chelating agent could be the organic fertilizer Nepal needed. The export is viable and could have a very positive impact on Nepal.

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