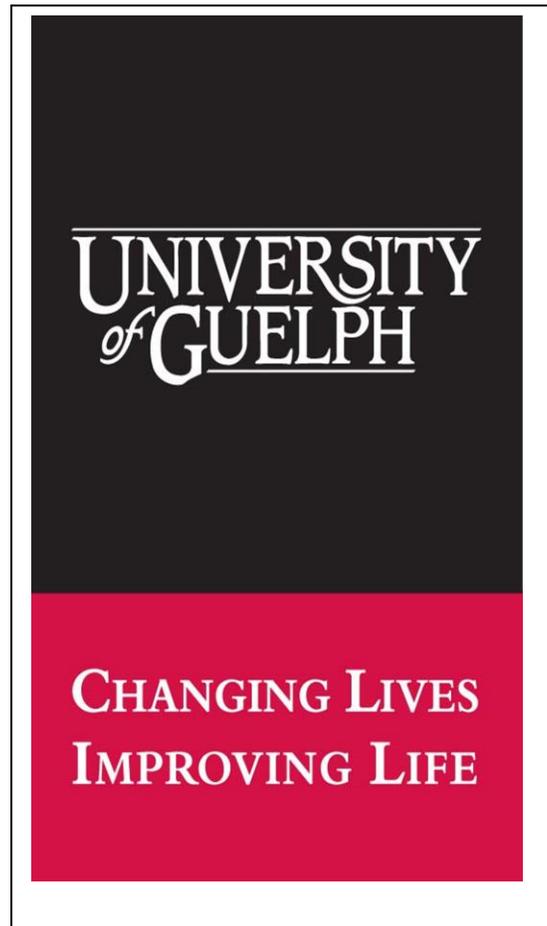


Exports to Nepal; Final Paper



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## **Part1 – Product Information**

### **About Firstline Seeds**

Firstline seeds is a company based out of Guelph Ontario where their research center is located (Firstline Seeds,2014). The company was founded in 1982 where 12 of the top seed growers collaborated to produce high quality seed soybeans and focus on the genetic improvement of the soybean (Eastern Ontario AgriNews,2002). The benefits of genetically improving the soybean are producing plants that are capable of producing more pods per plant which contain more seeds per pod, therefore, increasing yield (Monsanto Company,2014). In 1995, Firstline Seeds marketed their first food grade soybean seed(Eastern Ontario AgriNews,2002). Then in 1997, they were able to market their first roundup ready soybean(Eastern Ontario AgriNews,2002). In 1998, Monsanto became a large shareholder of the company introducing herbicide resistant genes into the crop(Eastern Ontario AgriNews,2002). Herbicide resistance has been a major benefit to Canadian farmers because it allows the easy control of weeds and pests by spraying the field with the roundup herbicide, eliminating all competing plants and weeds, and reducing the loss from pests drastically (Monsanto Company,2014). Because Monsanto has introduced the Roundup Ready gene into this product, there is a patent involved(Monsanto Company,2014). This patent makes it illegal for farmers to hold back seed with this gene and use it for planting in future growing seasons and new seed must be purchased every season (Monsanto Company,2014). With the genetic work and herbicide resistance now available in the seeds provided be Firstline Seeds, the yield

of the soybean plant has increased dramatically and has aided Canadian farmers with producing higher yields of higher quality crops for the past 30 years.

## **Canadian Soybeans**



(<http://philipshaw.ca/wp-content/uploads/2009/12/CanSoy4751.jpg>)

### About the Soybean

The soybean (*Glycine max*), is a legume native to Asia and is now grown worldwide for its numerous uses (SoyaTech, 2014). This oilseed is valued for its nutritional content that is made up of approximately 36% protein and 20% fat (SoyaTech, 2014). Soybeans have become such a valuable crop because of the wide variety of products that can be produced from this oilseed (SoyaTech, 2014). Approximately 85% of the soybeans produced annually are processed into vegetable oil and soybean meal (SoyaTech, 2014). The majority of the soybean meal produced is used in livestock feeds because of the protein content, allowing farmers to feed their livestock with a cheap and nutritional source of protein (SoyaTech, 2014). Other products produced from the soybean are soymilk, tofu, biodiesel and many other products, both industrial and food related (SoyaTech, 2014). With the nutritional value of the soybean and the endless uses for this oilseed, its evident why this crop has now become one of the major crops produced worldwide in recent years and will only become more valued and more widely grown in years to come.

## Benefits to Canadians from Exporting Soybean Seed

Firstline Seeds is one of the very few seed companies based out of Canada, Guelph Ontario being the location of the research center for Firstline Seeds (Firstline Seeds,2014). If a large quantity of soybean seed was to be exported to Nepal, the increased income of production for the company would create many more jobs for Canadian soybean seed producers. Also, with greater income for the company, more money could be put towards research in producing even better, higher yielding soybeans. Even better soybean seed would result in a better Canadian soybean crop, benefiting Canadian farmers throughout the nation.

## **Part 2-Export Potential to Nepal**

### Introduction to Nepal

Nepal is a small country located between India and China with a population of approximately 27.8 million people and increasing (CountryEconomy, 2014). In this country, agriculture is responsible for the employment of 66% of the country's population, while also accounting for 39% of the country's total GDP(Government of Nepal,2014). The country is split up into 3 major topographic regions, the tarai plains, the midhills, and the Himalayas, which holds some of the largest mountains in the world (Encyclopedia of the Nations, 2014). Agriculture in Nepal mainly takes place in the midhills where Nepalese farmers rely on subsistence farming in tough conditions to make ends meet (Encyclopedia of the Nations, 2014). The main crops grown in Nepal are rice, wheat, and maize with more cash crops being

grown in recent years (Encyclopedia of the Nations, 2014). Sugarcane, oilseeds, tobacco and potatoes are also grown throughout Nepal providing many regions with a food source (Encyclopedia of the Nations, 2014). There is also a very large population of livestock in Nepal that consists of poultry, goats, cattle and more, but unfortunately the products produced from these animals are poor quality and insufficient for the needs of Nepalese people (Encyclopedia of the Nations, 2014). With Nepal's increasing population and lack of increase in agricultural production to meet the increasing demand for food, the country of Nepal now has a food deficit (Encyclopedia of the Nations, 2014).



(<http://i.infoplease.com/images/mnepal.gif>)

### A Possible Solution to help the Problem

The main problem Nepalese farmers face is producing enough food to feed the increasing population of the country, approximately 27.8 million people (CountryEconomy, 2014). A possible solution to the problem is to grow high yield GMO soybeans from Firstline seeds, a Canadian company based out of Guelph Ontario that specializes in this crop (Eastern

Ontario AgriNews,2002). Soybeans are a crop that is grown in small amounts throughout the country of Nepal, but the quality of the seed is poor resulting in poor yields making the crop insufficient at feeding the Nepalese people (Sharma,1994). Improvement in genetics and practices has been needed to maximize the potential of this crop(Sharma,1994).

Benefits of Growing Soybeans in Nepal

Nepal would see many benefits of growing large quantities of soybean from seed produced by Firstline Seeds from Guelph Ontario. The soybean seed presently grown in Nepal is of poor quality(Sharma,1994). This means that the plants produced from these seeds will be poor quality and have poor yields, or could even be diseased from previous years. Getting clean, healthy seeds from Firstline Seeds would insure that a healthy crop capable of producing large yields could be grown by Nepalese farmers. Having clean, healthy seeds instead of poor quality seed would make a large difference in yields because a healthy high yield plant cannot be grown from poor seed and having high quality seed to start could mean the difference between the Nepalese farmer being able to feed his family for the year from his own crop, and having to purchase food to provide for his family.

Protein source	Comments (relative to soya)
Soybean meal	Protein 44%-46%, lysine 2.8%, good palatability. Because of its amino acid profile is highly digestible fits the requirements of many animals during all stages of their life. Incorporation rate of 20% common in pig feed.
Rapeseed meal	Lower protein level (34-38%) lower lysine level (2.27%), excellent balance of essential amino acids, slightly higher levels of methionine and cystine, higher fibre level than soya. Can be used as substitute for soya (e.g. up to half of soya used in pig feed could technically be substituted), not a preferred ingredient in the poultry sector.
Sunflower meal	Lower protein level (30%-35%), lower lysine level (1.68%) than soy meal but more methionine. Must be fortified with soybean meal to be used for feeding pigs and poultry. When used for feeding ruminants and horses it is generally mixed with grain.

Table 1-(<http://www.fediol.be/web/feed/1011306087/list1187970125/f1.html>)

Nepal has many species of livestock such as cattle, chickens, goats, and more, but these animals are unable to produce sufficient an amount of food for the population (Encyclopedia of the Nations, 2014). The Soybean meal that can be easily produced from soybeans is a cheap and effective source of protein highly valued for livestock feeds (Fediol, 2014). Table 1, as seen above, compares soybean meal with other commonly used protein sources used in livestock feeds (Fediol, 2014). For chickens and other poultry which rely on a grain/nutrient rich based diet to produce a large quantity of eggs or meat, the soybean meal would be a cheap way to supplement the diet of these birds with valuable protein, which would increase both meat and egg production of these birds. The same applies with goats, with larger quantities of protein, meat production as well as milk production from these animals would increase. As for cattle, there is no production of beef in Nepal. However, cattle in Nepal are also kept for milk production. Dairy farms around the world feed their cattle grains rich in protein to increase milk production per cow, and the high protein soybean meal in the diet of the cattle kept in Nepal would increase milk production as well. In the European Union, Soybean meal is an essential part of livestock feeds (Fediol, 2014). As seen in Table 2 below, oilseeds (soybean meal) accounts for 28% of the ingredients for livestock feeds (Fediol, 2014). Soybean meal also accounts for 68% of the protein in the livestock feeds as illustrated in Table 3 below (Fediol, 2014).

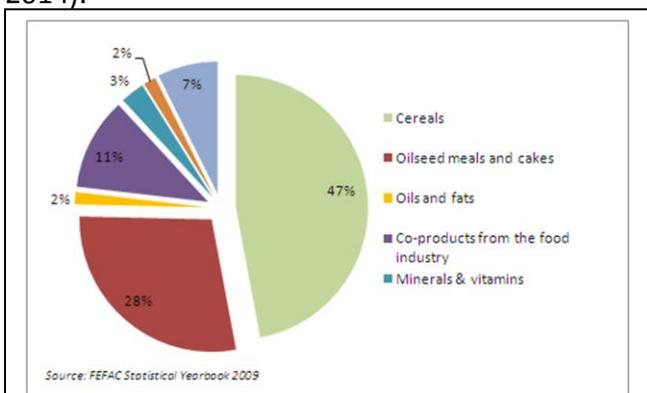


TABLE 2-  
<http://www.fediol.be/data/1317823127feed1.png>

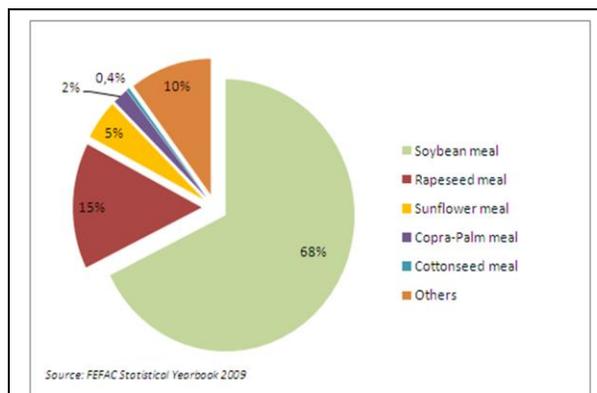


TABLE 3  
<http://www.fediol.be/data/1317823127feed>

There has also been an increase in the consumption of soy products in Nepal such as soy milk and soybean oil(Sharma,1994). Between 1978 and 1992, the import of soy based products into Nepal has increased from 2.39 million per year to 738.32 million per year(Sharma,1994). This number is much higher today, likely in the billions. If Nepal could produce a large enough soybean crop, not only could Nepal eliminate these imports, but a very large number of jobs could be created in Nepal processing and producing these soy products in the country, instead of having to purchase these products from other countries.



Lastly, because of the many uses of the soybean and it is valued worldwide, on the global trading market soybean is valued more than most crops. This means that if a Nepalese farmer was to produce more than he needed for the year, selling the excess crop could provide income to purchase other products they may need. If a large soybean crop was produced in Nepal, the country would see many benefits as well as lower the amount of undernourished people that exist in Nepal.

#### Costs/Downfalls of Growing Canadian Soybeans in Nepal

One of the downfalls of growing soybean from seed produced by Firstline seeds, is the fairly large input cost. The approximate per unit cost of a 25kg bag soybean seed is \$65 dollars

Canadian plus the shipping to get the seed to Nepal (Firstline Seeds,2014). However, if bought in bulk, the price goes down substantially, but the additional cost of shipping still applies(Firstline Seeds,2014). Another additional cost would be the Roundup herbicide to control pests if the Nepalese farmer wished to use this method. However, labour is cheap in Nepal so the cost of planting the soybean crop would be minimal. Also, herbicide would likely not be needed because it would be much cheaper for the farmer to remove any weeds or pests by hand which would save money, which is especially important for these farmers who have very small incomes to provide for their families for the year.

Another downfall to growing Firstline soybean seed in Nepal is that the company is partnered with Monsanto, and the patents that apply to nearly all of their products(Eastern Ontario AgriNews,2002). This means that and soybeans harvested from the soybean seed purchased from Firstline seeds would not be allowed to be used as seed in following years because of a seed agreement between the producer and the farmer(Monsanto Company,2014). This means Nepalese farmers would have to purchase soybean seed every year instead of keeping seeds from previous years. That means the rather high input cost to growing this crop would apply every year instead of once.

### In Conclusion

In conclusion, exporting soybean seeds to Nepal is an impractical solution to the problem Nepalese farmers face for a few important reasons. First of all and most importantly, the cost is much too high to be practical or useful for Nepalese farmers. The average annual income for the Nepalese farmer is around a few hundred dollars per year and to spend a large

portion of that, if not all of their income on soybean seed is impractical. Another reason this idea is impractical is that the average farmer would only plant a portion of their land in soybeans, because they require other fruits and vegetables to meet their daily nutritional needs. That being said, the average farmer would likely not even need one 25kg bag of seed to meet their needs. Finally, the seed provided by Firstline Seeds is herbicide resistant which is impractical for the needs of the Nepalese farmer. Labour is abundant for Nepalese farmers and it would be much more cost effective to remove weeds by hand opposed to using herbicide. Therefore the component of the seed that contributes to the large cost of the soybean seed is not even needed by Nepalese farmers and the patent that applies to the seed keeps Nepalese farmers from holding back seed for future years. In conclusion, exporting Firstline soybean seed to Nepal is impractical because of the high input cost each growing season and the patents that apply because of the herbicide component of the product.

### Recommendations

Although the idea of using GMO soybean seed from Firstline Seeds and Monsanto is impractical, there still is much potential from the soybean industry in Nepal. Conventional soybean seed, (non GMO), although harder to find in recent years, would be much more practical than roundup ready seed. The Nepalese farmers do not need to use herbicide because most weeds are removed by hand. Also the patent that applies to the roundup ready seed would not apply to some conventional seed varieties meaning Nepalese farmers could hold back some seed for future growing seasons, although some non-GMO seeds do have a seed agreement but not all of them. There are a few select companies based out of the United States

that still focus on non-GMO seeds (The Organic and Non-GMO Report, 2008). EMerge genetics is a company based in Iowa that does provide non-GMO soybean seed which is much cheaper than the Roundup Ready seed provided by Firstline seeds (eMerge Genetics, 2014). Some of eMerge's products do have a seed agreement in effect, but not all (eMerge Genetics, 2014). Another company that provides non-GMO soybean seed is Galena Genetics located the United States, in the state of Minnesota (Galena Genetics, 2014). This company specializes in non-GMO seed, although like eMerge, a seed agreement is still in effect on some of Galena's products (Galena Genetics, 2014). The use of non-GMO seed would cut the input costs of the product down drastically and there would be no need to buy seed in future generations if a variety without a seed agreement is chosen and money will be saved because there is no Roundup Ready gene. Nepalese farmers would see the benefits of using clean, healthy seed that carries better genetics and yields then what they are currently using, while not paying for the herbicide resistant aspect that is not even useful to them.

Another recommendation to make the exportation of soybean seed more practical is to have a seed distributor available to Nepalese farmers. Because the average Nepalese farmer would only require a small amount of seed, a distributor that could provide the farmer with what they need would cut costs. Another benefit to this is that money will be saved by buying large quantities of seed in bulk at one time instead of a higher per unit cost if the seed was to be purchased per bag. Shipping costs would likely be reduced by using this method as well. Using normal, non GMO soybeans that are hybrids to produce larger yields and not herbicide resistant as well as the use of a seed distributor will drastically lower the input costs for

Nepalese farmers while maintaining all the benefits associated with growing a large soybean crop.

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