

# **Export Potential of Sainfoin Seed**

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## **Section One: Product Information**

Sainfoin seed is a legume that originated from throughout Europe and Asia that has been used for forage for hundreds of years (Tilley 2016). It is a perennial legume with a deep root system that has been compared to alfalfa in protein levels. Plants have pink and white flowers and grow to be larger than alfalfa plants between eight and thirty-six inches tall (Tilley 2016). Seeds are relatively large with eighteen thousand five hundred seeds per pound de husked planting is recommended to be alternative rows when being mixed with other grasses (Pollock 2016). Since arriving to North America it has been widely used for pastoral grazing and reclamation crop. Northstar seed has begun breeding new varieties of Sainfoin and research is still on going at the University of Saskatchewan. AC Mountainview, a new variety of Sainfoin coming to market this year is best suited for Western Canada is drought resistant, hardy disease and winter resistant which would suit the mountainous regions of Nepal.

### **Product Background**

Northstar seed is based out of Neepawa, Manitoba and is owned and operated by Don Pollock. Main office is centered in Neepawa and a warehouse is operated out of Okotoks Alberta. Seeds are grown in the Dauphin, Roblin, Ste. Rose, and Fork River areas of Manitoba and they work closely with 360 Ag consulting to produce cutting edge products for the public. The majority of processing, manufacturing happens in Manitoba due to the Proximity to a major rail, truck and container freight center is nearby at Winnipeg to keep costs down and the Alberta headquarters allows Northstar be immersed in the middle of the prairies for competitive sales in western Canada and nearness to major production sites of turf grasses, forage and most important to this paper legumes. AC Mountainview, a new variety of genetically engineered sainfoin will be offered for the first this year and with expert Surya Acharya still doing research with the University of Saskatchewan more are bound to hit the market in coming years.

### **Labour, Costs, Issues**

Due to the hypothetical nature of many costs are not known. At the moment Northstar seed devotes very little of its major production to sainfoin as before the release of AC Mountainview. Seasonality would also come into play as western Canada has a growing season from approximately March to September but growing season can be extremely volatile and be extremely short or suddenly freeze over.

### **Nutritional Information**

Sainfoin is a legume that is full of protein similar to alfalfa, it has better drought resistance than alfalfa along with cold tolerance. The most attractive characteristic of Sainfoin is the condensed tannins that are present in the plant. As alfalfa is known to cause bloat in ruminant animals it only has tannins on its seed coat and not on its leaves so if a pasture is not managed properly cattle for exam will bloat which lowers weight gain and in extreme cases death. Sainfoin is one of the only legumes that there isn't any chance of bloat because of the amount of tannins in the plant, it has been shown that even just planting fifteen to twenty percent of Sainfoin in a pasture of alfalfa decreases the chances of bloating from forty to eighty eight percent on grazing trials (Iwassa 2016). Beef steers have shown preference to Sainfoin when planted beside Alfalfa. Sainfoin is extremely palatable and full of tannins and those tannins improve the absorption of amino acids which improves milk production in dairy and beef cattle, sheep, goats and most other ruminants (Acharya 2016). AC Mountainview is the first variety of Sainfoin that is able to survive being mixed with Alfalfa, withstand cutting and grazing and still be able to grow back at the same rate as the alfalfa and other competing grasses (Acharya 2016)

### **Patent Intellectual Property Constraints**

There are a few genetically modified varieties of Sainfoin like AC Mountainview, Eski, Melrose, Remont, Renumex, Shoshone, Delaney and the most popular Nova. They were all released by different organizations but most commonly they are centered towards thriving on the prairies in the west. There is no patent on a product that would work in terms of Nepal and AC Mountainview is one of the few varieties that is new. Surya Acharya with Agriculture and Agri-Food Canada (AAFC) is still doing test sights all through the prairies. So, the playing field is quite open for new and updated options for places with climates that are not the same as the western Canadian prairies.

## **Market Opportunities**

Due to the fact the seventy percent of Nepal's population is employed in the agricultural sector and it accounts for thirty eight percent of the countries national Gross Domestic Product (GDP) there would be a sizable market in Nepal for Sainfoin seed (Sanjyal 2016). It could be marketed to nomadic herders, sedentary farmers, dairy farmers of multiple species of ruminants like yak, cattle, sheep and goats for improvement of weight gain and milk production. Though not a requirement of farmers it would be an improvement of production on all fronts as land use in Nepal is very tight and overgrazing is a problem that has become a huge problem in the last ten years so farmers need a solution of better feed not more pasture to graze because there is not more pasture to be found.

## **Benefits to Canadians**

By developing Canadian companies like Northstar Seed Canada could take a more prominent place on the world stage a that is typically dominated by European companies like Bayer and American companies like DuPont and Monsanto. With a more noticeable place on the world stage trading opportunities, more bilateral trade and increased export could raise the Canadian GDP. As many countries are struggling with finding feed for cattle and other ruminants in production as space becomes limited a relationship with Nepal could expand to helping other countries around it like China, India, Tibet to help solve the limited space problem but allow cattle and other animals produce sufficiently on a smaller ecological footprint.

## **Environmental sustainability of growing and manufacturing in Canada**

It has been proven that cultivars of sainfoin produce less biomass than alfalfa meaning that sainfoin is not as invasive species (Iwassa 2016) it will thrive and do well when established but not take over an area as they are usually the first pick of wildlife when close to shelterbelts. AC Mountainview is very disease resistant and has shown promise in reclamation of soils and in soils with high salinity which would be useful where cash crops cannot be grown. Production of Sainfoin could be done sustainably in the use of land that isn't typically used and manufacturing would be handed well by Northstar seeds already existing sites.

## **Section Two: Export Potential to Nepal**

Nepal is a small landlocked country surrounded by the two giants India and China. It is trapezoidal in shape with an area of one hundred and forty-seven thousand, one hundred and forty-one square kilometers. There are three regions in Nepal Mountains which is thirty five

percent of the landmass, hills which makes up forty two percent and the terai makes up twenty three percent of the landmass. Total cultivable area is three million hectares and the cropping intensity at a whopping one hundred and eighty three percent. Overall, agricultural practices are vital to the lively hood of the Nepalese; employ seventy percent of their people and account to approximately forty percent of the national GDP (Sanjyal 20116). Sainfoin seed would be a great addition to all kinds of farmers in Nepal; Nomadic herders of yak, cattle, sheep and goats, and sedentary farmers and dairy farmers.

### **Transportation**

Due to Nepal being a landlocked country shipping would have to go through most likely China or India and have to abide by their export and import laws. Northstar seed does the majority of their shipping by boat so most likely they would go through India. Northstar seed would have to make sure they have the required permits from the government to export, have a legitimate reason for exporting the seed and what its use is. Along with that the weight of the product must be specified, who is exporting it and who is importing it. All relevant information is specified by the Seeds Act and Seeds Regulations Requirements and as long as they are contaminated with disease or invasive species everything goes as planned (ABCs of seed importation 2016). For shipping it would go out of either Vancouver or Montreal depending on the preferred mode of transportation and which would be more cost effective for the company and the Nepalese contacts. Whichever the choice of hub to ship out of would affect which warehouse the product would be going out of.

### **Storage After Export**

Storage of sainfoin is relatively easy, as long as it is kept dry and out of sunlight it will last for years and years. It doesn't need to be refrigerated but keeping moisture out is a heavy concern as is with any storage of seeds. In a warehouse or any sort of building with a foundation would do. In areas, such as the terai westernized farmer is becoming more and more popular more modern storage sites will be available and within urban city centers warehouses could be used to distribute to smaller centers and farmers in more remote areas

### **Cost Analysis**

Due to how large the seeds are and the single seed to a pod cost of production is quite high. The cost of sainfoin approximately is four dollars a pound which is relatively high on standards of seed. Don Pollock recommends that it be seeded at twenty-seven pounds per acre.

The monetary amount would come out to one hundred and eight dollars per acre for a pure stand which is extremely out of the price range for a typical farmer in Nepal. As said before sainfoin's curative properties are still useful when in a mixed stand with alfalfa or other grasses like orchard grasses. For a fifty percent stand it would cost fifty-four dollars and for twenty percent stand it would cost thirty-six dollars per acre which would be much more cost effective for Nepalese farmers.

### **Benefits to Nepal**

Increasing the quality of Cattle in the dairy and meat industry helps Nepal compete with neighboring India and China to raise it higher on the world stage; opening up new chances of trade and trading partners. Not only will this help large ruminates such as cows, the huge population of goats, yaks and sheep would benefit immensely from the raised amount of protein in their diet. As a large part of Nepalese agriculturalists are nomadic rotational grazing is used regularly; but for livestock to produce sufficiently a lot of land must be grazed which leads to lose of native grasses, soil erosion. On the hillsides and mountainous regions, it is a huge problem and if herders keep abusing their pasture land they will not be able to keep up their practices. More efficiency and sustainability will help farmers to produce better quality products for within Nepal and for export out of the country.

### **Contacts in Nepal**

To begin with getting in contact with the Ministry for Agriculture would be the first step to getting reliable information as to where to go to next. After going through the government, the sales strategy would be to target larger farmers who have a herd of some kind of ruminants that use pasture so that smaller sized farmers and herders could see how it works and how well the animals do. Word of mouth is one of the most powerful ways to advertise and in a country, that isn't that well developed would more than likely work the best. The goal is to operate out of small agricultural retailers available to everyone who wishes to use the product.

### **Organizations to get started**

Already there are multiple organizations that are involved with the research that Surya Acharya organizations like Northstar Seed, AAFC, the government of Alberta, and the University of Saskatchewan. To begin export to Nepal there would need to be involvement of the ministry of Agriculture and companies that would help distribute the product.

### **Future studies**

Future studies that would need to be done are trials and breeding of a variety of sainfoin that would be tailored to Nepal's climates and warm and wet temperatures. AC Mountainview would do well in the hilly and mountainous areas of the country but not in the terai and semi hilly areas where it is very wet for the majority of the year because sainfoin doesn't do well in areas of high water table flooding zones. More research would have to be done into the area of shipping costs as Northstar Seed hasn't shipped sainfoin out of the country or sold it not in a seed mix.

### **Conclusion**

In conclusion sainfoin would be a great choice of adding protein value to ruminants in Nepal, would be sustainable and environmentally friendly to help with erosion on hillsides and the loss of native grasses. It would boost Canadas GDP and raise our standing globally in the seed market and develop jobs in research, manufacturing and processing. Pure stand sainfoin is much to expensive and Northstar seed would never make a profit but by marketing a mixed stand strategy the non-bloating factor would still be useful and the heighten protein within a combination of alfalfa or native grasses would lead to greater success of Nepalese agriculturalists.

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