

**Fenugreek Seeds:
Nepalese Export Potential to Canada**

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Part I: Product Information and Overall Benefits to Nepal

Introduction: Exporting Ground Fenugreek Seeds

Fenugreek (*Trigonella foenumgraecum*) is a legume known for its unique taste and medicinal properties. It is proposed that ground fenugreek seeds be exported from Nepal to Canada, marketed to natural health companies as a supplement, and to Canadian spice suppliers. Details of the benefits of the crop to Nepal and Canada will be outlined further.

Planting and Cultivating Requirements for Increased Productivity

Environment

Though currently a marginal crop in Nepal, fenugreek can be grown on diverse land types: October-December in Terai, August-November in mid-hill regions, and March-May on hillsides (Bhatta, Subedi & Bhattarai, 2014). Though it is a hillside crop, commercial production is limited to urban and semi-urban areas due to proximity to market (Bhatta, Subedi & Bhattarai, 2014).

Resistant to climatic stress, *Trigonella f.* is grown in arid regions with moderate to low rainfall, with the possibility of light irrigation during germination and flowering (Bhatta, Subedi & Bhattarai, 2014). It is also tolerant to frost, signifying it can be successfully grown in mountainous regions that reach freezing temperatures (Australian Agronomy Conference, 2006).

Soil

Fenugreek is best planted in loose soil with good drainage, at a pH of 6-7 (Bhatta, Subedi & Bhattarai, 2014). For the largest yield a fertilizer mix of: 50 kg/HA nitrogen, 30 kg/ HA phosphorus, and 20 kg/ HA potassium is recommended (Bhatta,

Subedi & Bhattarai, 2014). Since fenugreek is a legume, inoculating seeds with a rhizobium culture will also increase yields, and consequently increase fixed soil nitrogen during crop rotation (Agrifarming, 2015). As well, since fenugreek propagates in loose soil, the crop will help retain the rich topsoil layer (Bhatta, Subedi & Bhattarai, 2014).

Cultivation

Germination can take 7-10 days, therefore transplanting may be viable option for drier areas to improve growth success (Bhatta, Subedi & Bhattarai, 2014). The leaves can be quickly cultivated 40-60 days after planting, after which they can be harvested every 25 days (Bhatta, Subedi & Bhattarai, 2014). Additionally, the seed crop matures in 3-4 months and yields 300-400 kg of seeds per acre (Bhatta, Subedi & Bhattarai, 2014).

Labour and Cost

Fenugreek is widely grown by Nepalese subsistence farmers, which suggests minimal cost. *Trigonella f.* seeds do not shatter, which improves yield however results in more labour for seed cultivating, threshing, drying, and grinding (Ladizinsky, 1979). Notably, conservation agriculture practices in Nepal found labour to be relatively equally distributed between men and women with approximately 45% and 55% done respectively (Halbrendt, Paudel & Chan, 2015).

Expensive technologies are not required, as simple seed cleaning, drying, and separating techniques can be used (Ladizinsky, 1979). There is the opportunity for a valuable trade-off between increased labour and benefits, as growing the legume will add fixed nitrogen to the soil to be used by future crops, limit soil erosion,

produce a nutritious leafy green, increase the adoption rate of seed separation techniques to ensure healthy future crops.

Economic Potential

The seeds can be sold to natural health product companies as a supplement, and to spice suppliers that are continually looking for new flavours (Kwan, 2015).

Companies proposed to be buyer of fenugreek seed are:

Health Supplement Companies

Vita Health Products Inc.

ATT: Nature's Bounty

150 Beghin Avenue
Winnipeg, MB R2J 3W2, Canada
Phone: 1-877-925-8487

Nature's Way Canada

2696 Nootka St.
Vancouver, BC V5M 3M5, Canada
Phone: 1-800-665-3414

Ingredient Suppliers

Griffith Laboratories Limited

757 Pharmacy Ave
Scarborough, ON M1L 3J8, Canada
Phone: (416) 288-3050

Caldic Canada

6980 Creditview Rd
Mississauga, ON L5N 8E2, Canada
Phone: (905) 812 7300

Current Canadian fenugreek supplements from Nature's Bounty are priced as: $12 \text{ c CAD}/610\text{mg capsule} = 0.000197\text{ \$ CAD}/\text{mg} = 0.197 \text{ \$ CAD } g = 197 \text{ \$ CAD } / \text{kg}$ (Natures Bounty, 2015). Alternatively, ingredient blends from Caldic can cost between 200-500\$ CAD/ kg and are sold in large quantities for industrial food production (Kwan, 2015). Even if only 10% of a spice mix is fenugreek, theoretically 20-50\$ CAD/kg of fenugreek is used. Compared to the 3\$ CAD/kg fenugreek reaches in Nepalese market, exporting to Canada could result in a substantially larger income (Kathmandu Post, 2015).

Identifying and Overcoming Constraints

The highest production rates of fenugreek are in Western and mid-Western Nepal. Paradoxically, these are the regions with lowest sales and productivity (Bhatta, Subedi & Bhattarai, 2014). As the largest producers of the country, Nepalese hillside farmers have an opportunity to substantially benefit from fenugreek seed exportation. However, there are some limitations for subsistence farmers:

Limited Fertilizer Access

To overcome fertilizer needs, fenugreek can be intercropped with other organic nitrogen and phosphorus fixing plants, such as pigeon pea to improve soil nutrition. As well, micro-dosing fertilizer during germination and seed production is a strategy to overcome large fertilizer usage.

Rhizobia Inoculant Availability

A legume, fenugreek needs the appropriate soil rhizobia to fix nitrogen (Singh, Kaur, & Singh, 2008). Participatory agronomy may be a solution to assess rhizobia strains in soil. A potential local business opportunity may be for farmers to conserve and propagate strains in their own soils, with the end goal of selling to other farmers as an inoculant for the appropriate seeds.

Transportation to Market

The highest producing fenugreek farmers do not sell their product, as they do not have access to market. Lack of transportation could be another potential local business opportunity, as locals with an animal or motor vehicle could offer

fenugreek seed pick up for a small fee. As well, if the fenugreek market rises, Nepalese transportation service companies may be implemented for collecting seed.

Labour

Hand pounding would greatly increase the labour needed for this product, and may be a key constraint if the proper tools are unavailable. Seed processing mills or animals could be a key solution to this issue. Grinding the seeds in Nepal will make the product cheaper and easier for transport, as less volume will be consumed per kilogram.

Part II: Export Potential

Market Opportunity

Fenugreek seed in natural health supplements and spices are proposed, as they are both high value products, and follow similar processing regulations. Fenugreek also has the added benefit that it is already approved in Canada as a natural food product, due to sales in encapsulated form by Nature's Bounty and Nature's Way (Nature's Bounty, 2015).

There is a prominent Canadian niche for new, natural health products, as sales of dietary supplements in Canada have a projected sale growth of 1.9 billion CAD by 2019, with 377 million CAD attribute to natural herbal supplements (Euromonitor International, 2014). Analysis also shows that the most important driver for supplement market growth is "newness", particularly in the immunity and digestive care sector, both of which fenugreek can classify (Euromonitor International, 2014). Additionally, spice imports to Canada saw a significant increase between 2012 to 2013 to 168 million CAD, of which 55 million CAD were

spices similar to that of fenugreek: curry powders, ginger, saffron, and thyme (TFO Canada, 2013). Therefore, fenugreek can fit into this market gap both in the supplement and spice Canadian market.

Next Steps for Export to Canada

The Canadian Food Inspection Agency (CFIA) requires that seeds imports to Canada follow the *Seed Act* and *Seed Regulations* (CFIA, 2015). Key steps requiring obtaining proper documentation of these laws include laboratory testing by accredited parties, accurate labeling, and importation by an authorized seed importer. Future steps may also include further chemical analysis of fenugreek to assess any legal and scientifically proven health claims, which could result in the crop being used as a pharmaceutical (CFIA, 2015).

Conclusion

Fenugreek is a viable product to be exported from Nepal to Canada. No foreign aid strategies were mentioned besides potential participatory analysis of soil conditions for rhizobia, as the cropping of fenugreek itself can be maintained and be sustainable by Nepalese farmers themselves with little to no new technology. Being readily grown by Nepalese subsistence farmers, and having a legitimate market in Canada, fenugreek seeds have vast potential to be a successful product.

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