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Nepalese Horse Gram:
A Potential Nepalese Export
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Introduction

Horse gram (*Macrotyloma uniflorum*) or “kulthi” as it is commonly known, is one of the lesser known beans (Bhardwaj & Yadav, 2014). It derives its English name due to its use as forage for horses and cattle in the Western world (Banham & Fuller, 2014). These small, somewhat kidney shaped legumes, which are beige to brownish red, are just as suitable for human consumption. The stems and leaves of the plant are frequently used as fodder, while the beans are eaten by people (Banham & Fuller, 2014). Horse gram is a variety of pulse of significant value to hillside Nepalese farmers, which holds the potential for export to other nations.

History & Geography

Pulses constitute some of the world’s most ancient cultivated crops and form a crucial element of human diets (Mazhar, Buckles, Satheesh, & Akhter, 2007). Horse gram is originally native to Africa and South Asia (Sudha, Begum, Shambulingappa, & Babu, n.d.). It is extensively cultivated in the dry areas of Australia, Sri Lanka, Burma, and India (Sudha et al.). Horse gram is a valuable crop for sloping lands that are poor in mineral content in either hot, moist areas, or semi-arid up to 1,500 meters (Banham & Fuller, 2014).

Cultivation & Harvesting

Horse gram is able to tolerate low soil fertility and salinity but not water logged soil, making it an important crop in the drier areas (Bhardwaj & Yadav, 2014). It does not demand much effort, and can be used as green manure to strengthen depleted soils (Bhardwaj & Yadav, 2014). It is often planted on fallow fields and is seen as an essential component of crop rotation (Banham & Fuller, 2014). The bean can be successfully intercropped with cereals. It also does well as an understory crop in orchards and plantations. Horse gram is a very drought-resistant crop mostly grown in regions with less than 900 mm of annual rainfall, although it is capable of being grown with as little as 380 mm. The plant requires temperatures of 20-30°C. It takes an estimated amount of 120-180 days for the plant to reach maturity (Banham & Fuller, 2014). Once the leaves shrivel and the pods turn light brown, the plants can be uprooted (Bhardwaj & Yadav, 2014). They are then dried in the

field or under cover, and threshed to remove the pods. The yield from one acre ranges from 275-400 kg of seed (Bhardwaj & Yadav, 2014).

Agronomic Issues

Immediately after sowing and irrigation, herbicides are sprayed (TNAU Agritech Portal, 2014). This must be done within three days of sowing, or it is possible to harm the crop. This application will control the early growing weeds. Later emerging weeds must be manually removed. In most parts of Nepal, the probability of stem fly contaminant is high. This pest affects the plant at the early growing stages causing drying and withering. It can however be controlled by two spraying of pesticides. During growth, other pests such as aphids, leaf hoppers, and whiteflies, can also damage the crops. Fortunately, they can also be constrained with pesticides. Horse gram can be affected by root rot, which has to be removed and the area drenched. The crop can also rarely be affected by cercospora which can be distinguished by the presence of brown spots. Powdery mildew is noticed with the presence of white powder on the leaves (TNAU Agritech Portal, 2014).

Environmental Issues

Across Nepal, farmers have recognized a shift of the monsoon season by one month in the last 20 years (Poudel, 2014). There has also been a decrease in frequency but an increase in intensity of rainfall, followed by shorter growing seasons. The mountainous areas undergo high amounts of natural disasters such as landslides, floods, extended periods of droughts, and even recently hailstorms (Poudel, 2014). Farming in such conditions is difficult, especially when relying on precipitation for agricultural practices. Horse gram being a pulse, is however a very resilient crop which does not require much rain (Banham & Fuller, 2014). It is very drought resistant and grows well on hillsides (Banham & Fuller, 2014). This benefits Nepalese hillside farmers which often times do not have proper irrigation systems.

Health and Nutritional Value

In all cases, horse gram seeds should be cooked before human or cattle consumption (Banham & Fuller, 2014). The bean is high in iron, a good source of protein, and contains an adequate amount of calcium (Sudha et al., n.d.). It has been found to be rich in polyphenols, and have elevated levels of antioxidants (Bhardwaj & Yadav, 2014). In Ayurvedic medicine, it is employed to treat asthma, cough, bronchitis, kidney stone, as well as urinary problems (Banham & Fuller, 2014). The pulse also has the capacity to control and decrease high blood sugar and insulin resistance. Dishes made with the whole beans (containing the seed coats) are better than those without which lack the anti-diabetic property (Banham & Fuller, 2014).

Social and Cultural Significance

Although horse gram is largely cultivated in Southern India, the people of Nepal are familiar with it and use it in many of their traditional dishes (Banham & Fuller, 2014). The reason for which the pulse is not already extensively intergraded in Nepalese agriculture, is simply due to the fact that there has been no need to do so with such a large exporter close-by. However with climate change worsening, its low input and resistant properties may become more valuable and demanded. If horse gram large-scale cultivation is successful in Nepal, it could lead to farmers enjoying better living conditions and a general improvement of life.

Economic Benefits to Nepal

By establishing an export of horse gram to Canada at a fair trade price, hillside Nepalese farmers would gain by having an increase in their income and the opportunity to enhance their way of life. Both Canada and Nepal have a similar population that is close to 30 million, however, the GNI per capita based on purchasing power parity for Canada is listed at \$42,610 (USD) in 2013, and at \$2,260 (USD) for Nepal in the same year (World Bank, 2014a, 2014b). This trade has the capability of improving this ratio, and helping farmers out of poverty.

Export Potential

With such a large producer of horse gram just South of Nepal, competition for trade should be expected. The majority of Indian horse gram that is sold internationally travels to the Middle East (Banham & Fuller, 2014). If Nepalese horse gram targeted Canada, it would have the potential of selling. A niche market would also succeed in avoiding Indian competition. Canadian retailers currently do not offer any selection of horse gram (Pulse Canada, 2014). This is an advantage for the Nepalese variation which has the opportunity of monopolizing the trade. Potential retail buyers include the Whole Foods regional office in Chicago that is in charge of coordinating new suppliers in Ontario, as well as Walmart Global Sourcing which works to connect international suppliers with their stores (Walmart, 2014; Whole Foods, 2014). Whole Foods can be reached at 312.799.5600, and Walmart at gsnwpodt@wal-mart.com. In terms of transportation, lentils are transported in linen or jute fabric bags (weighting from 10-100kg), however, transport as bulk cargo is becoming more common (Transport Information Service, 2014). In order to receive a phytosanitary certificate, any grain or seed that aims to be imported to Canada must first go through an inspection of its facilities followed by a direct cleaning of its product once it arrives in Canada (Canadian Food Inspection Agency, 2014). What is currently unknown and required to properly evaluate the export potential of Nepalese horse gram to Canadian markets are import fees, trade barriers, and the actual demand of Canadian consumers. This last point is the most crucial, for we may advertise its nutritional value, its organic nature, and the economic benefits it would bring to Nepalese farmers, we have no sure way of knowing if would actually sell. Consumers could simply see the strange new pulse as unfamiliar and hold no interest in it. However, horse gram export remains a promising way to alleviate poverty for hillside Nepalese farmers.

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