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Nepalese Cotton (*Gossypium arboreum*)

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Gossypium arboreum is a species of cotton usually cultivated in Asiatic areas called “Old World”, as reported by Liu, Guo, Lin, Nie and Zhang (2006). These authors cited Xiang and Shen (1989), affirming that *G. arboreum* was domesticated and grown for 2000 years in China, and was introduced from India. Furthermore, this is a species cropped in only 2% of the world (Barozai and Husnain, 2012). It is widely known in the field of genetics as a source of alleles useful for the improvement of cotton cultivars (Rh, 2003), because it contains many stress resistance alleles (Barozai and Husnain, 2012). Genes resistant to stress conditions such as drought, salinity, cold, heat and pests were found when mapping and studying the genetic material of *G. arboreum* by *in silico* analysis, and several features were identified, such as resistance to Cabbage Leaf Curl Virus and Turnip Mosaic Virus, which are serious problems to cotton crops and cause significant losses worldwide (Barozai and Husnain, 2012). Furthermore, gene were found in *G. arboreum* shown to confer resistance to an important pathogen of cereals crops called *Blumeria graminis*, which usually causes powdery mildew, and also resistance to *Pseudomonas syringae* (Barozai and Husnain, 2012). These genes can be used to protect future crops from many problems faced by cotton crops, even in different cultivars (Barozai and Husnain, 2012).

Genes from *G. arboreum* were also found to be regulated by parasitic infections, mainly by nematodes, which cause losses around \$100 billion per year (Barozai and Husnain, 2012). Carter (1981) reported resistance of this cotton species to the nematode, *Rotylenchulus reniformis*, that is a critical pest in tropical and subtropical areas. This study analysed the response of plants subjected to nematodes and how long they took to get rid of infection, and observed that *G. arboreum* killed the parasites quicker and suffered fewer nematodes than a susceptible variety.

Another benefit of *G. arboreum* was studied by Annan and Houghton (2008) is its use for heal wounds; this study showed that this species conferred a higher growth of fibroblasts in patients treated with leaves and seeds that were properly prepared. Furthermore, the authors found higher protection from oxidative damage in cells when using *G. arboreum* as treatment.

Multinational industries interested in genetic improvement of crops would be curious to use *G. arboreum* resistance genes to change and create resistance in other cotton cultivars that suffer from stress conditions, such as viruses. The development of a “better” cotton crop might reduce labour and promote higher productivity.

***G. arboreum* in Nepal**

This species of cotton is grown in Nepal but it is not very common worldwide , constituting only 2% of global production of cotton as cited by Barozai and Husnain (2012).. Given that the studies cited above showed the resistance of *G. arboreum* to different biotic and abiotic stress conditions, this species of cotton might be grown very successfully by farmers in different areas of Nepal including hillsides (Food and Agriculture Organization of the United Nations, 2014).In addition to benefits improved production might provide to local cotton farmers, *G. arboreum* can be used to improve the crafts industry via its fiber (Brite and Marston, 2013 and Basnet, 2006) which can increase employment rates and consequently the GPD.

This species of cotton has potential as an export crop for Nepal. Agriculture is a major sector of the Nepalese economy, and according to the Department of Agriculture of Nepal, this activity employs 66% of the total population (2014). This fact is very important to Nepal's economy in general because if agriculture is further developed, the GDP (Gross domestic product) will also increase, stimulating the improvement of the population's quality of life

(Department of Agriculture, 2014). Therefore, the encouragement of agricultural products of Nepal as export products could lead to a stride in the country's economy and also to Nepalese farmers. About 83% of Nepalese farmers cultivate their crops in hills and mountains, as reported by Food and Agriculture Organization of the United Nations (2014). Poverty is a significant issue faced by Nepalese population (United States Agency for International Development, USAID).

Part 2 – Export Potential to Canada

Given these observations, exporting of *G. arboreum* might bring many advantages to Nepalese farmers. Canada might be interested in import this product. The fiber textile industry in Canada receives a significant number of products from another countries, currently mainly from United States, Turkey, China and Indonesia (Statistics Canada and US Census Bureau, 2014).

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