

Nomination for Export of Plant-Prod Fertilizers from Canada to Nepal

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Product Information

Background:

Plant-Prod Chelated Micronutrient Mix is a micronutrient produced in Canada. This product has strong attributes that make it a suitable nomination to be exported to Nepal. It is water soluble and can be used in either soilless mixes as a regular nutrient feeding program or in soil to correct deficiencies. It is produced by a company called Master Plant-Prod Incorporated which is based out of Brampton, Ontario. Master Plant-Prod Inc. manufactures and distributes primarily mixed fertilizers, however they also deal with chemical fertilizers. Master Plant-Prod manufactures and distributes within Canada and also export products internationally. With over 60 years in business, Plant-Prod products are at the leading edge of Canadian greenhouse, nursery, and turf industries (Government of Canada, 2014).

Plant-Prod fertilizers consist of chelated micronutrients with varying levels of macronutrients depending on the specific fertilizer formula. These chelated micronutrients, iron, manganese, zinc, copper, boron, molybdenum, are essential components of soil for plant growth and high yield production. The term chelated refers to how usually reactive micronutrients are held or attached by chelating agents, such as ethylene diamine tetra-acetate, that prevent them from reacting and allow them to be used effectively by the plant. However plants do not consume high levels of these micronutrients and therefore the accompaniment of macronutrients with the chelated micronutrients creates a more attractive product. The majority of Plant-Prod fertilizers have a basis of these chelated micronutrients accompanied by the macronutrients nitrogen, potassium, phosphorus (Plant Products Co., 2012a).

Plant-Prod Infrastructure and Products:

Master Plant-Prod has a large and developed network within Canada. The Ancaster, Ontario, branch of Plant-Prod deals with the sales side of the fertilizer industrial. The Commercial Sales Manager of the Ancaster branch, Jerry Weber, can be contacted by email at jerry.Weber@plantproducts.com, or by phone at 905-301-0349 (Plant Products Co., 2014). Jerry will be a strong partner to have with his knowledge and experience in the fertilizer industry. With his assistance, the logistic issues will be dealt with and ordering of correct products can be achieved. These products will need to have the strongest positive impact to Nepalese agriculture. One particularly strong candidate for the export to Nepal is Plant-Prod Classic 20-20-20. It is the most widely used product that Plant-Prod creates due to its all purpose nature accompanied by a balanced formula. The formula 20-20-20 means that it is comprised of 20 percent of all three macronutrients: nitrogen, phosphorus, and potassium. It is also accompanied with the standard base chelated micronutrient mix which will allow Nepalese farmers to apply crucial micronutrients simultaneously within a simple nutrient program.

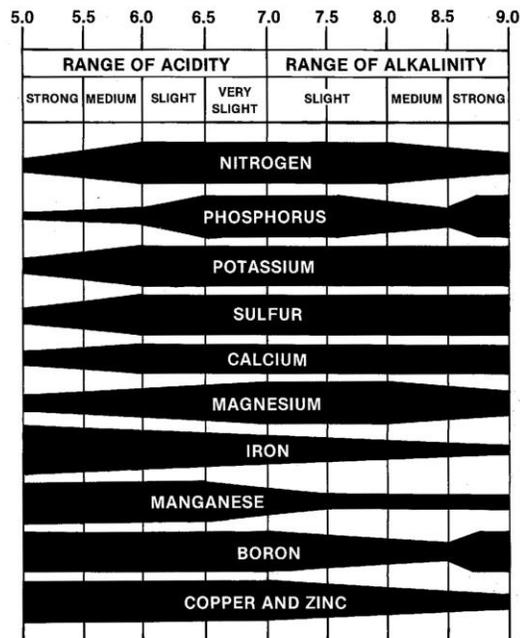
An important aspect to the application of nutrients to a field is to understand what the current levels of nutrients are in that particular field. This can be done through soil sample testing which will produce chart similar to Figure-1. This does not mean that whatever levels are low are the ones that need to be applied. The degree for which these nutrients are available to plants is relative to the pH of the soil. Figure-2 illustrates the ranges of pH and respective nutrient up-take availability.

Figure-1 (<http://www.ces.ncsu.edu/fletcher/programs/nchops/observations.html>)

	mean	median	99% CI	std dev	min	max
P Index	46	40	35.9 - 56.0	37.8	3	212
K Index	88	84	76.9 - 99.0	41.6	28	227
Ca (% of CEC)	62	61	58.5 - 65.1	12.0	29	84
Mg (% of CEC)	20	20	18.6 - 21.0	4.5	11	32
Mn Index	354	210	279.7 - 428.9	281.0	47	1118
Zn Index	136	106	110.9 - 161.5	95.2	30	585
Cu Index	126	106	101.8 - 149.8	90.4	9	505
S Index	53	35	42.8 - 62.3	36.7	21	175
humic matter (%)	0.25	0.27	0.22 - 0.28	0.11	0.04	0.60
CEC (meq/100g)	9.4	8.7	8.6 - 10.2	3.0	4.6	23.9
base saturation (%)	86	87	83.6 - 88.7	10	53	100

Figure-2 (http://www.spectrumanalytic.com/doc/library/articles/soil_buffer_ph)

**AVAILABILITY OF ELEMENTS TO PLANTS
AT DIFFERENT pH LEVELS FOR
MINERAL SOILS**



The results of soil sampling and the availability of the nutrients to a crop are crucial factors in high yielding farming. However, the practice of soil sampling is expensive and due to this it is impractical for the Nepalese. Therefore the Classic 20-20-20 product is the most ideal as it is all purpose and adds even amounts of each macronutrient. It is more suitable to Nepal currently however in the future soil testing may become more practical for Nepalese and they will move from the all purpose fertilizer to more specified mixes.

Classic 20-20-20:

The Classic all-purpose fertilizer is potent on a wide variety of plants. It comes in solute form; making packaging compact and light which is ideal for transporting. Due to its soluble nature It can be administered through irrigation systems, sprayer applications, hydroponics, and any injection system. This products wide variety in application techniques arises from the products high solubility and concentration (Plant Products Co, 2012b). The high concentration allows for small packages diluting to volume. This is evidenced in how one 10 kg tub can be diluted to 30 000 litres depending on application method(Plant Products Co, 2012b). Accordingly, one of the input costs for a nepalese farmer would be to decide what sort of application system works best for their specific operation. The macronutrients will each provide different growth characteristics to the plants. The nitrogen will produce rapid green up and leaf expansion while the phosphorus and potassium content will enable root and shoot growth (Plant Products Co, 2012b). The Classic 20-20-20 has many attributes that make it the most suitable fertilizer made in Canada to be exported to Nepal.

Benefits for Canada:

The export to Nepal of Plant-Prod's Classic 20-20-20 will create an increase in sales for a Canadian company which will possibly create more Canadian jobs. Canada is a country that relies heavily on export as we have an excess of natural resources over people. This means that Canadian companies are constantly looking to expand into new markets internationally. This includes investing into these markets directly which has expressed upward trends in Canada over the last decade (Corporate Research Department of Canada., 2013). This also applies to the export of Plant-Prod merchandise. Plant-Prod has already had international presences in the USA but also many capital programs in Europe and South America (Government of Canada, 2014). This reveals the competitive edge that Plant-Prod is trying to acquire, however they do not have any large programs in most of Asia. The export of Classic 20-20-20 to Nepal may seem like a small project, although it has massive potential to open up the rest of Asia to importing Canadian fertilizers. Canada has a strong mining industry which includes the production of the potassium. The increased sale of this product will mean that the mining industry is also benefitted. The Export of Classic 20-20-20 has massive potential to do great things for a Canadian Company which will in turn benefit Canada economically.

Critical Analysis of Potential Benefits to Nepal

Introduction of Nepal:

Nepal is a small country located in South Asia between China to the North and India to the South. Geographically, Nepal is diverse with lowlands, hill, and

mountain regions. The variance of landforms is accompanied by a large variety of Agriculture. The Nepalese government has emphasized the importance of agriculture and have department called the Department Of Agriculture (DOA). This department is in charge of developing the Agricultural industry in Nepal. Their objectives include using the geographical diversity to improve agricultural production. The currency of Nepal is called a rupee and is worth approximately 0.01 USD. The population of Nepal is roughly 31 million and the population only has literacy rate of 45 percent. The low literacy rate is a product of multiple things. One such thing is poor standard of living that is associated to poor economical development. Almost two thirds of the population is living off the agricultural industry (Dhoj Y., 2014) . This is significant when compared to Canada which has slightly less then 2 percent of the population working in the agricultural industry. The high percent of population that works in agriculture can be accounted to minimal amounts of new technology being adopted by the average Nepalese farmer. Nepal is a poor country that shows lots of promise for the near future if they choose to adopt new agricultural technologies such as the application of Plant-Prod fertilizers

Target Purchasers and Costs:

The ideal targets for the purchase of Classic 20-20-20 would be individual farmers. This would ensure that the farmer and Plant-Prod would be making the most money. However, this is only possible with larger farms where capital to purchase the applicator and product is easy which is not the case in Nepal. With such a high amount of the population in the agricultural industry it is inevitable that the farms are small in comparison to the farms found in Canada. This means that it is not feasible for each individual operation to have their own applicator and to buy their own product. This

means that it would probably work best if many different cooperative projects were established. This way the farmer would pay the cooperative organization to custom apply and buy the Classic 20-20-20 product. The size of applicators and cooperatives will be dependent on where that particular cooperative is located.

For the smaller cooperatives a backpack sprayer could be purchased for around \$75-150. Larger cooperative organizations will most likely have multiple sprayer applicators and would have to arrange for transport of water to fields. To ship enough fertilizer and applicators for a larger sized cooperative it would cost about \$5 500(A1 Freight Forwarding Inc., 2014). This would get the product to Chennai, India, then estimated cost to truck from Chennai to Kathmandu, Nepal would be another addition \$2500. The total cost to get the product to Kathmandu, Nepal, would be around \$8000. This price would not be maintained as a less expensive alternative will hopefully arise. Another cost would arise within teaching the Nepalese farmers how to use this product. Further studies will need to be done regarding this issue and how to best bridge the educational gap.

Benefits to Nepal:

Classic 20-20-20 has strong potential revolutionize the agricultural industry. The soil application of this product is the most suitable to the Nepalese agricultural sector as a large prohibitor of yield is base on farmers not applying fertilizers correctly if at all to agricultural land (Khadka, 2013). Potatoes are a very important crop to the Nepalese people as they have one of the high potato consumption rates in the world. This is evident in how the potato production from 1990 to 2010 increased by around 225 percent (Khadka, 2013). Potatoes are a very nutritious food however they require high

levels of soil nutrients to grow (see Figure-3). This means that potato yields in Nepal suffer as the average Nepalese does not practice adequate fertilizer application. Classic 20-20-20 has prospective to transform potato production in Nepal. It can replenish the soil after potato crops have taken large amounts of the nutrients. This is how it can be applied to a single crop although the Classic 20-20-20 is an all purpose fertilizer. All purpose fertilizers can be applied to any crop and the well nourished soil will hopefully reward higher yielding crops.

Figure-3 (2013 Rosen C.)

Safety:

Plant-Prod products have minimal safety concerns. The micronutrient product has a small amount of boric acid that can cause irritation if it comes in contact with open wounds. This boric acid can also cause irritation if ingested or if it gets into a persons eyes. A spill can be vacuumed up if still in dry solute form and can be diluted with large

Nutrient	Tuber yield, cwt/A					
	Vines	200	300	400	500	600
Nutrient uptake lb/A						
Nitrogen (N)	90	86	128	171	214	252
Phosphorus (P)	11	12	17	23	28	35
Potassium (K)	75	96	144	192	240	288
Calcium (Ca)	43	3.0	4.4	5.9	7.4	8.9
Magnesium (Mg)	25	5.9	8.9	11.8	14.7	17.6
Sulfur (S)	â€”	8.8	13.2	17.6	22.0	26.4
Zinc (Zn)	0.11	0.70	0.11	0.14	0.18	0.22
Manganese (Mn)	0.17	0.03	0.04	0.06	0.07	0.08
Iron (Fe)	2.21	0.53	0.79	1.06	1.32	1.58
Copper (Cu)	0.03	0.04	0.06	0.08	0.10	0.12
Boron (B)	0.14	0.03	0.04	0.05	0.06	0.07

amounts of water if in solution (Master Plant-Prod Inc., 2013a). The 20-20-20 Classic product has a small amounts of potassium nitrate however authorities only need to be contacted if excessive ingestion occurs (Master Plant-Prod Inc., 2013b). All together, the risks with this product in terms of human and environmental safety are insignificant.

Critical Summary:

Classic 20-20-20 is a very viable export option to Nepal. It has potential to benefit both Canadian and Nepalese economies. Issues arrive in the shipping of the product. A more direct route would be a lot more economical then the one listed above in the transportation steps. If Master Plant-Prod were to already have exporting programs to Asia it would a far more feasible opportunity. The most important issue with the success of the export of Plant-Prod fertilizers to Nepal would be the cooperation between Master Plant-Prod, the Nepalese Cooperatives, and the Nepalese farmers. Only with a strong relationship and all three parties being on the same page will this product succeed.

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