“Promoting Canadian Agrifood Exports”

Final Report

Gabriel Roballo

Wednesday, 8:30 am

AGR*1110

November 24, 2014

Part I- Product Information

Compost is a cycle in which nature returns nutrients back into the environment by decomposing organic material into fertilizer with the use of microorganisms (Composting, n.d). This aids vegetation and crops to grow healthier and with a higher yield (Compost, 2008). If this process can increase the crop yield, how can the yield of the compost be increased and how can this be of use to Nepalese famers in their everyday lives? Compost must be set with a constant temperature and a certain carbon to nitrogen ratio in order for it to decompose organic material best (Compost, 2008). How can Nepalese farmers make sure that their compost is functioning at its highest? The answer is simple, use a compost thermometer to maintain the temperature and to determine how much source of carbon or nitrogen needs to be added.

The compost thermometer is simply a thermometer used to measure the temperature of a compost pile to help determine whether the compost pile is too cold or too hot which can then be adjusted to optimize the compost's decomposition (Lee, 2004). The temperature at which a compost pile should reach is 60°C to effectively kill weed seeds and pathogens which is essential to keep the compost pure and to prevent the spread of weeds (Lee, 2004). However, temperature over 71°C is destructive because few thermophilic organisms actively carry on decomposition past this temperature which can leave the compost dysfunctional and useless.

(Washington, n.d). There is a small threshold in which compost is in its prime decomposition in terms of temperature therefore the compost thermometer is an effective tool to optimize compost. Simply “feeling” the temperature with one’s bare hands is a highly inaccurate method to determine temperature (Washington, n.d). The compost thermometer is a stainless steel temperature dial attached to a long probe of different sizes which is inserted to the middle of the compost pile to determine temperature (Washington, n.d) The only labour required is the addition of the carbon and nitrogen sources and the mixing off the compost.

The compost thermometer is a hardy, stainless steel tool that will last a long time if handled properly and therefore there is no machinery required, little labour required, no seasonality issues, or added inputs required, such as fuel and feed; there is also no current patents/ restraints on this product (OMEGA, 2014). This is a tool with no future problems or commitments bought at a low cost to improve the quality of compost. This product can be either a niche product or a product needed by a large population depending on whether Nepalese are informed of the product and its potential (Biocomp 2014). Pragya Seeds Nepal is a non-profit organization that works to improve and inform Nepal of its agriculture and it’s potential in compost which helps to make the compost thermometer more popular which in turn brings a higher demand for the product (Pragya, 2012). With the increase in knowledge about agriculture, especially compost, Nepal is going to have a large market opportunity and be

required by a large population if compost thermometers were available in Nepal. In terms of benefits to Canada, it will not have an immediate spike in the Canadian economy but it will help the economy in terms of trade between Canada and Nepal. Of course, with more trade between the countries, this creates a higher national income for Canada which betters the economy and creates more employment. (WTO, 2013) Also, with an increase in crop fertility for Nepal, there is a higher crop yield which will increase the amount value of crops imported to Canada which will benefits both countries.

Part II- Benefits to Nepal

The compost thermometer is a product that is aimed for individual small holder farmers who can use the tool every day to once a week to improve their compost. If farmers needed to, they could share the tool throughout the villages; but since it is a small tool that is needed frequently, that would not be the case. Since many Nepalese rural farmers only have one to two acres to cultivate, it is easier to make compost for a smaller land because there is generally a smaller compost pile (United Nations, 2011). According to the United Nations, composting is on the rise in Nepal and Nepalese farmers are becoming more aware of their own agriculture. Farmers are seeing the benefits to organic compost versus synthetic fertilizers by noticing the

longevity difference of about three months. Biocomp Nepal in collaboration with My Climate Foundation is an organization that collects three tons of organic waste a day from a local Kalimati market and uses it to make compost which is then sold to local farmers (United Nations, 2011). This organization is helping Nepal farmers by increasing their crop yield but this comes at a cost at about five dollars a bag. Instead of buying valuable compost, farmers can make it from their own waste from their land such as leaves, manure and food scraps from their table. This will not only save them money but will also help lower their already small carbon footprint and helping the environment by putting nutrients back into the earth instead of landfills (United Nations, 2011). This process will also create healthier and tastier food for the families of Nepal and increase the family's income significantly, creating a better life for Nepalese and contributing to the development of the country (United Nations, 2011). This will however hurt the Nepalese employees that work for Biocomp Nepal by taking away their business if Nepalese farmers produce their own compost from their own land. Canada has the opposite demographic in terms of rural to urban population; Canada has about eighty percent urban (see Appendix 1), twenty percent rural while Nepal has eighty percent rural and twenty percent urban (Statistics Canada, 2013). Although Canada has smaller percent rural population, Canadians still use the compost thermometer to increase yield in their compost piles. Micro-farming is now becoming more popular with Canadians in small properties of five acres and less

which then creates more need for the compost thermometer (Compost Council…, n.d). If Canadians can compost in urban populations why can't Nepalese use the compost thermometers in their rural populations? Nepalese farmers can use this tool just as Canadians do to better their compost. An environmental issue that Nepal is having is that, every monsoon the erosion of nutrient rich top soil occurs with floods sweeping away the soil. With the rise of compost in Nepal, the soil can become nutrient rich again with the addition of compost. This fixes the problem of the reduced yields made by the monsoon floods (Heifer, 2010). The thermometer will only make it easier for farmers to create compost therefore it is required by a large population and it will be a success.

The sole Canadian Company that supplies these thermometers is OMEGA located in Laval, Quebec which specializes on the sales and manufacturing of many products related to temperature measurement and controls, data acquisition, pH and conductivity etc. This company uses resources and supplies from Canada therefore this benefits Canada once again but indirectly because it uses other Canadian company supplies to manufacture the thermometer. All the materials like the stainless steel, glass cover for the meter etc. originate from Canada. For transportation of the compost thermometer to Nepal, the product must come from the OMEGA distribution centre in Laval, QC, transported by possibly a Canadian courier company such as Purolator to Purolator Air. It will be flown to Nepal, taken to a

distribution depot and driven over to a hardware store in Nepal such as Kailash and Karmacharga hardware stores where it will be purchased by the Nepalese farmer who desperately need a compost thermometer. All this can happen without refrigeration and storage issues because it is primarily a light, small tool that can help with composting. The only issue is that the Canadian thermometer is quite expensive; at around seventy dollars for the twelve inch thermometer to a hundred dollars for the seventy two inch thermometer. This product is robust, heavy duty, hardened stainless steel with a fog free dial that does not come cheap. This will have future complications to the marketing of the Canadian compost thermometer compared to a lower quality, Chinese compost thermometer. If the product was around sixty dollars cheaper, than I would suggest sending about ten thousand thermometers at first to determine the demand for the product. To ship this product to Nepal it would cost around $13,208 by Purolator including taxes (Purolator, 2014). When the demand is higher, more thermometers would be shipped to Nepal. However, this is sustainable to obtain profitability because it is light in weight which results in lower shipping costs.

Once again, this product helps and benefits the needs of the Nepalese farmers to produce healthier, better yielding crops (United Nations, 2011). Nepalese farmers usually create a pile of compost throughout the year and forget about it until the next year where it is used as fertilizer. What they do not know is that they can produce better, more fertile crops if

the compost was treated better (United Nations). The thermometer works as a regulator, telling when the compost it too hot or too cold (Washington, n.d). When the compost is too cold, less than sixty degrees Celsius, this means the pile needs to be aerated by mixing. Mixing the pile creates more surface area so oxygen and microbes can work to break down the compost. Nepalese farmers can simply mix their small pile of compost with a pitchfork or by hand to increase the temperature (Washington, unknown). When the thermometer points out the compost is too hot, less than seventy degrees Celsius, this can kill the aerobic bacteria which are essential for the breakdown of organic material, which then reduces compost yield (Mitchell, 2012). To lower the temperature of the compost, Nepalese farmers can simply add a carbon source such as leaves, paper, cardboard, branches etc. This will bring the temperature back to the optimal temperature meant for compost (Mitchell, 2012). Compost is also beneficial for villages near the river “Dudhwa Nala” which floods frequently, taking essential top soil with it, as stated before (Heifer, 2010). The production of compost helps farmers to create better yield with the already ruined soil they have to cultivate with. This also helps the food scraps and market leftovers to be diverted from landfills and instead used as a useful commodity which in turn reduces greenhouse emissions (Biocomp, 2014). As stated before, a Canadian Company such as OMEGA can supply these thermometers to hardware stores.

OMEGA Spectris Canada, Inc.

OMEGA ENVIRONMENTAL (OMEGA)

976 Bergar

Laval(Quebec) H7L 5A1 Canada

514-856-6928

dasinfo@omega.ca

Karmacharya Hardware Store

Ranipauwa Pokhara, Nepal

+977 61-521625

karmacharyapokhara.com

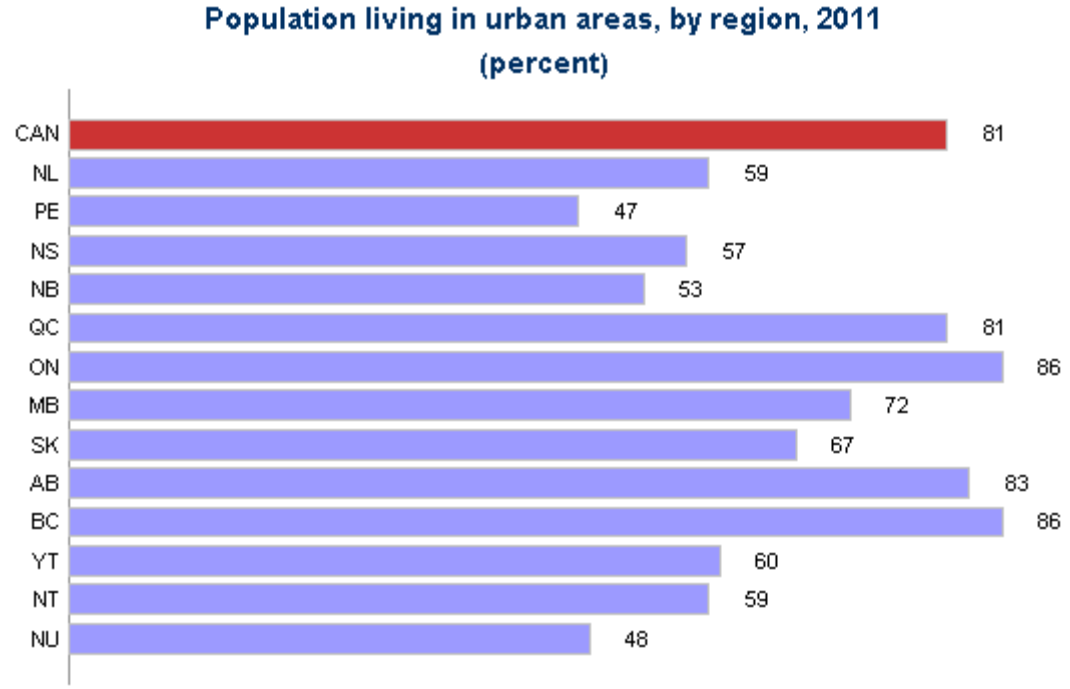
A way that the compost thermometer can be sold it by advertising it during busing market days like Saturdays (Biocomp, 2014). The hardware store owner can hang up signs, give out flyers or verbally promote the thermometer to increase sales. Tell the farmers that they can profit greatly from increasing their crop yield with better organic fertilizers instead of the costly, less profitable synthetic fertilizers. Of course there will eventually be competition for the sale of the thermometer from countries such as China which can provide the product at a substantially lower price. According to the website, Alibabi.com, China can sell the product at a price from one to ten dollars depending on the length of the thermometer. With this significant difference in price from OMEGA's pricing, shipping compost thermometers to Nepal to help Nepalese farmers is not recommended; however the product is still an ingenious invention that should

help Nepalese farmers no matter where it is sold from. The use of compost thermometers is highly recommended and is an opportunity that should be seized all together.

All in all, with compost making on the rise it is with no doubt that the compost thermometer will be useful in Nepal as it is already in Canada (United Nations, 2011). The compost thermometer will increase the quality of the compost which will increase the yield, creating more food and a higher salary for the average Nepalese farmer. Nepal should invest in importing compost thermometers, not necessarily from Canada but from closer countries that manufacture the product cheaper such as China. This will decrease the cost of transportation as well. Eventually, compost can be made with the use of human feces with the decline in the amount of nutrients in soil around the world (Heifer, 2012). What was a waste in now becoming a useful resource in agriculture for Nepal.

Appendixes

Appendix 1: Percent populations of Canadian living in urban areas by province.



(Statistics Canada, 2013)

References

Biocomp Nepal. (2014). Compost.

Compost.(2008). *Cold Spring Harbor Protocols, 2008*(11), pdb.rec11468.

Compost Council of Canada. (n.d). *Canadian compost.* Retrieved 11/19, 2014, from http://www.compost.org/English/ENGLISH_INDEX.htm

Composting. Retrieved 11/17, 2014, from http://www.recycleworks.org/compost/

HeiferNepal6043 (Producer), & Heifer (Director). (2010). *Youtube video: "**going back to compost.wmv"**.* [Video/DVD]

Lee Valley. (2004). *20" compost thermometer.* Retrieved October 4, 2014, from http://www.leevalley.com/en/garden/page.aspx?cat=2,42578&p=57098

Mitchell, R. (2012). **Turning compost by temperature**.

Omega. (2014). *Compost thermometers.* Retrieved 10/4, 2014, from http://www.omega.ca/pptst_eng/A12P.html

Pragya Seeds Nepal (Producer), & Pragya Seeds Nepal (Director). (2012). *PGSI compost nepal.* [Video/DVD]

Purolator. (2014). *Purolator quotes.* Retrieved 11/16, 2014, from https://www.purolator.com/en/home.page

Statistics Canada. (2013). ***Canadians in context - geographic distribution***. Retrieved 11/18, 2014, from http://www4.hrsdc.gc.ca/.3ndic.1t.4r@-eng.jsp?iid=34

Orgnanic waste in nepal. United Nations (Director). (2011).[Video/DVD]

Washington State University. (unknown). *Compost needs.* Retrieved 10/05, 2014, from http://whatcom.wsu.edu/ag/compost/fundamentals/needs_temperature.htm

WTO World Trade Organization. (2011). *Ten benefits of the trading system.* Retrieved 11/17, 2014, from http://www.wto.org/english/thewto_e/whatis_e/10ben_e/10b07_e.htm