

**Critical Evaluation of Sluggo Professional as a Potential Export to Nepal**

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**Part I – Product Info**

### **Description of the Product**

Like many other countries, Nepal has pests that are detrimental to the farms, such as snails. Sluggo is an effective and safe molluscicide product that controls snail populations effectively with a natural active ingredient of iron phosphate which is found in human dietary supplements (Sluggo, 2000). It is non-toxic to almost all mammals and birds and even a large number of bug species, which makes it an excellent choice for organic farmers who want to avoid environmental harm. Sluggo is a bait, so the target mollusk species must eat it for the Sluggo take effect and kill the pest. It can control various breeds of mollusks (Sluggo, 2000). The African Giant Land Snail is one of the pests that could be controlled.

### **Production of the Product**

Sluggo is produced by the Neudorff Corporation located in Germany (About neudorff, n.d.). The chemical mixture is a trade secret since it is in competition with other molluscicides, but the patented formula is titled Ferramol (Slug and snail..., n.d.). The active ingredient in the Ferramol mixture is iron phosphate, which comprises 1.0% of the compound, and inert ingredients comprise the other 99.0% (Biconet, 2013). Since the active ingredient is iron phosphate, and the product has already been tested and proven safe for most wildlife, it is not required to know what comprises the 99.0% of inert ingredients (Biconet, 2013; Slug and snail..., n.d.). However, although iron phosphate is non-toxic to most animals, the inert ingredients could still have some negative effects on wildlife; therefore it would be suitable to test Sluggo more for toxicity.

### **Usage and Application of the Product**

Sluggo professional is a very simple product to apply, with general guidelines for achieving optimal results (Engage Agro, 2011). A hectare of land requires between 25 and 50 kg of Sluggo based on the severity of infestation to be effective, which is an optimal measurement for the

subsistence farmers in Nepal who own on average roughly a hectare of land (Engage Agro, 2011; Sharma, 1999). Broadcast application requires any standard broadcast spreader, while row application would require any standard granular spreader (Engage Agro, 2011). Spreaders would allow fast application but hand application allows more selective and cost-efficient usage (Engage Agro, 2011). For more information on the different spreaders, see the “Machinery Required and Cost” subtopic in “Part I – Product Info.”

### **Benefits to Canada**

**Overview.** The Wholesale Niche agricultural company Engage Agro deals with Sluggo Professional, which is one of the products they have licensed for marketing in Canada with Neudorff North America (Engage Agro, 2014). If a market opportunity opens in Nepal, it could promote trade opportunities in Nepal and possibly mean that Engage Agro may require marketing professionals that understand the Nepalese markets. Engage Agro is not interested in expanding into a large company, but a few extra jobs could be created through marketing and resale if Nepalese retailers were interested (Engage Agro, 2014). If Engage Agro were to expand to Nepal, they would need to partner with Neudorff head office in Germany, which deals with international product sales, since Neudorff North America does not deal with sales outside of North America (T. Tripp, personal communication, October 20, 2014). AEF Global is another wholesale agricultural company located in Quebec, are already internationally based, and would be capable of exporting the product to Nepal once given time to acquire the proper licensing for the sale of Sluggo in Nepal (T. Tripp, personal communication, October 20, 2014).

**Tertiary Industry.** Tertiary industry in general would benefit from exportation, because since the tertiary industry is the final sale to consumers and to other companies as well as transportation, exporting would vitally affect it (InvestorWords, n.d.). Simply put, exportation is a

crucial part of the continued growth of Canadian business because it allows the businesses to grow and develop by selling their goods and services in other countries (Canada's state..., 2013). By exporting, the need to be efficient increases for those Canadian companies competing in the global market and in turn the companies will be able to lower their costs, thereby decreasing the sale price (Canada's state..., 2013). Stimulating the tertiary market in Canada is essential because it is a catalyst for small businesses to expand their influence and add jobs to the marketplace, which in turn provides Canada with revenue to improve the country as a whole (Canada's state..., 2013). As a small business, Engage Agro would be able to expand in such a manner if they were to expand their licensing practices to the Asian markets and Nepal. In addition, the company AEF Global would experience increased revenue and the subsequent increases in efficiency, size and workforce that would follow.

**Transportation.** To get products from one point to another in business, transportation is essential, and having efficient options of transportation can help businesses flourish, which in turn helps the economy of Canada. Any transportation companies based within Canada that Engage Agro, Neudorff of AEF Global deal with will benefit from the sale of their tertiary service of transportation. In turn, more jobs may additionally be added to the transportation sector.

### **Comparing and Contrasting Similar Products Available from Canada**

Deadline M-Ps and Slug-Em are competitor molluscicides in Canada (Murphy, 2014). The active ingredient in Deadline M-Ps and Slug-Em is metaldehyde, which has both advantages and disadvantages when compared to Sluggo, which is an iron phosphate based molluscicide (Murphy, 2014). Below is a table outlining the advantages and disadvantages that each molluscicide has.

|                               | Deadline M-Ps and Slug-Em  | Sluggo  |
|-------------------------------|--|---|
| Advantages of Each Product    | <ul style="list-style-type: none"> <li>- Do not kill insects that are beneficial to the plants or predators of molluscs</li> <li>- Slugs stop feeding immediately after ingestion start to overproduce mucous, which causes the mollusc to die quickly from dehydration</li> </ul> | <ul style="list-style-type: none"> <li>- iron phosphate is non-toxic to animals and therefore is much safer for farmers to spread who own animals</li> <li>- iron phosphate is not toxic in small amounts to humans so it is okay if a little is ingested accidentally</li> <li>- The mollusc that ingests the pellet will stop feeding immediately but also will leave the area to die a few days after ingestion</li> </ul> |
| Disadvantages of Each Product | <ul style="list-style-type: none"> <li>- Metaldehyde is toxic to animals extra care should be taken to ensure they do not ingest the bait</li> <li>- The bait pellets become ineffective if they sit too long and start to become mouldy</li> </ul>                                | <ul style="list-style-type: none"> <li>- Sluggo is normally spread in higher quantities than products with metaldehyde as the active ingredient so it can be more expensive to apply</li> <li>- When there is a large population of molluscs in an area, the ability of Sluggo to control slug population is not as reliable as metaldehyde based baits</li> </ul>  |

Sourced from: (Murphy, 2014), (NPIC, 2013)

Based on the advantages and disadvantages of the competitor products Deadline M-Ps and Slug-Em compared to Sluggo, it is reasonable to conclude that although Sluggo is a more expensive approach, it is a much better option to control slug and snail populations safely. In addition, Sluggo also has the added benefit of indirectly affecting the spread of diseases in Nepal; for example, the giant African land snail is a carrier of meningitis (GISD, 2010). By causing the snail to leave the area and die in a secluded area, the meningitis disease has a smaller chance of infecting anyone who consumes food from an attacked field.

### **Environmental Factors Regarding Usage of the Product**

The product is toxic to some aquatic life so avoiding direct or large runoff application to water bodies is strongly recommended (Engage Agro, 2011). Although unsafe for aquatic wildlife, Sluggo is non-toxic to humans, birds, wildlife or pets so it is a pesticide with few negative health aspects as long as it is kept out of water bodies (Sluggo, 2000).

### **Potential Pests the Product Can Control**

According to the Global Invasive Species Database, the giant African land snail, an invasive species in Nepal, lives in warmer, humid climates around forests and disturbed agricultural areas (GISD, 2010). The lower half of Nepal fits this habitat description and farmers could provide the niche market for the product, since the African Giant Land Snails thrive in disturbed areas.

### **Machinery Required and Cost**

Since Sluggo is non-toxic in low quantities to humans, it is a safe product to handle, it is acceptable to spread it with bare hands as long as the safety regulations on the product label are strictly followed. However, if the user wants to spread faster and does not know which type of spreader to buy, then they can purchase or otherwise gain access to one of the following appropriate pellet spreaders.

**Broadcast spreaders.** Broadcast spreaders are push-behind, compact spreaders that can be easily maintained and used. Some are also relatively inexpensive, with prices ranging at Home Depot, as an example, to be anywhere from \$35.00 to \$500.00 (The home depot, n.d.). Normally broadcast spreaders are better suited for spreading than drop spreaders because as they spread, the fertilizer, or in this case- insect bait, is thrown in all directions or a specific direction, which makes the job easier to accomplish (Lewis, n.d.). The product that the user is spreading, which in this case is Sluggo, should come with approximate application amounts based on the situation, which

should allow the user to set the application speed to efficiently use the product (Lewis, n.d.). If the user wants to efficiently spread the Sluggo to ensure none is wasted, using a broadcast spreader is highly recommended over simply spreading with hands, since it is difficult to manually spread anything evenly.

**Granular spreaders.** Even simpler than broadcast spreaders are the granular spreaders, of which a good example is the Granomax spreader (Granomax..., n.d.). Some advantages the Granomax spreader has over broadcast spreaders include the fact that it is less expensive than most broadcast spreaders being priced at \$69.99 on amazon.com, as well as being lightweight and compact (Granomax granular..., n.d.). The small nozzle allows the user to be more selective where the molluscicide is spread if there is a specific area of the field that must be addressed. A disadvantage would be that it would take longer to spread the Sluggo with the Granomax than it would with a broadcast spreader, although it is still faster spreading than manually spreading Sluggo.

### **Company Contacts in Canada**

At Engage Agro, contact is Dave Wright; his email is [davewright@engageagro.com](mailto:davewright@engageagro.com). The phone number of the company is (519) 826-7878 (Engage Agro, 2014).

At AEF Global in Quebec, information contact email is [info@aefglobal.com](mailto:info@aefglobal.com), and the (Toll free) telephone number is 1-866-622-3222 (AEF Global, n.d.).

At Neudorff North America, contact is Tim Tripp, the Commercial Product Manager; his email is [tim.tripp@neudorff.ca](mailto:tim.tripp@neudorff.ca) and his phone number is (519) 803-3261 (personal communication, October 20, 2014).

## **Part II – Critical Analysis of Potential Benefits to Nepal**

## **Introduction to Nepal**

Nepal is a small country located just north of neighbouring India geographically, with fourteen zones which are made up of seventy-five districts (Maps of World, n.d.). The population of Nepal is approximately twenty-nine million people, which is quite similar to Canada's population (Nepal facts, n.d.). The main source of income for Nepal is agriculture, which measures as 40% of the GDP of Nepal; of which the main export is rice (Nepal facts, n.d.). The Prime Minister of Nepal is Jhala Nath Khanal and the President is Ram Baran Yadav (Nepal facts, n.d.). Each of the seventy-five districts have a chief district officer who upholds the law and manages the branches of government in their own respective district (Nepal facts, n.d.). Nepali is the language of Nepal while Hinduism is the most popular religion practiced in Nepal (Nepal facts, n.d.). The capital city of Nepal is Kathmandu, which is populated by nearly a million people and spans nearly 20 square kilometres (Nepal facts, nd.).

## **Cost Analysis to Assess Profitability**

The price of the product is roughly \$8.95 per pound, and it is recommended that twenty two to forty four pounds per acre should be applied (Biconet, 2013). Since one hectare is about two and a half acres and the average land ownership in Nepal is about one hectare, it would cost approximately \$492.25 for a coverage of one entire hectare of land. This price point would not be profitable at all for one farmer or family; however if neighbours pooled money to stop an invasion before it were to take momentum and spread to the neighbouring fields, then it would have a potential profit value. On a larger scale, multiple villages purchasing the product, through a co-op for example, would also be logical if an invasive species threatened a larger area. Additionally, companies that deal in pest control could possibly find a new market in Nepal by dealing with villages or small groups of farmers to help deal with pest invasions.



### **Benefits to Nepal**

The reason people buy Sluggo is to control snail and slug populations since it is a molluscicide. By purchasing Sluggo, the people of Nepal could control many different invasive species of snails and slugs. A prime example of invasive species is the giant African land snail, which is the second worst invasive species in Nepal according to the Global invasive species database (GISD, 2010). The giant African land snail is a particularly large species of snail that can grow to enormous proportions; the largest ever recorded weighing in at two pounds and about fifteen inches long (The world's Department..., n.d.). The giant African land snail also has a varying appetite; it has been known to feed off of more than 500 different plants, including many field crops and even sometimes feed on the paint of houses if other foods are scarce (The world's Department..., n.d.). The snail is capable of living with a high population density since on average around 150 can survive on an area of one square metre of agricultural land.

Sluggo could help prevent health problems for the people of Nepal as well because the giant African land snail may be a carrier of the nematodes that carry eosinophilic meningoencephalitis, known as meningitis (GISD, 2010). The giant African land snail also causes black pod disease in cocoa plants. By introducing Sluggo, it can help control these environmental and human health hazards as well as economic damage to farms (GISD, 2010).

### **Negatives with Exporting to Nepal**

Sluggo is non-toxic to most wildlife, but not all; some aquatic life are negatively affected by Sluggo (Engage Agro, 2011). If a farmer were to apply Sluggo close to a water body and water runoff causes the Sluggo to move into the river or stream, then downstream the fish may be unhealthy or even dead from contamination. Therefore, it is important that the product label is followed strictly when applying the product.

### **Exporting the Product**

Getting Sluggo from Canada to Nepal is not easy; there are no direct routes to the country. Goods could be exported from the Port of Halifax direct to Mumbai, India. This would be a good choice for crossing the ocean because most of the cargo moved from Halifax goes to Asia (Global Markets, 2014). From there, land delivery is the only option. UPS could move a reasonable amount of cargo, but for commercial amounts a ground freight company in Nepal would have to pick it up in Mumbai.

Another option could be to ship from Vancouver. Based on an ocean freight estimate system available from A1FreightForwarding.com, a standard 40 inch by 48 inch pallet with 150 pounds of Sluggo would cost roughly \$392.67 USD to ship from Vancouver, Canada to Chennai, India and 150 pounds of the product would itself cost \$1342.50 (A1 freight..., n.d.). The total cost to the retailer based in Nepal would be about \$1735.17.

### **Future Studies for the Product and Unknowns**

It is not known what is in the inert ingredients of Sluggo that comprise 99.0% of the compound, but it is possible that one of the ingredients could be toxic to one or more common species of wildlife (Slug and snail..., n.d.). Therefore, it would be solid scientific practice to conduct more studies on the negative effects of Sluggo on wildlife.

Another study that would be beneficial to the consumers would be to test the effectiveness of Sluggo on various invasive species of Nepal, such as the giant African land snail, so that consumers can compare it to other products and make an informed decision based on evidence.

### **Competing Products in Nepal**

After investigating Alibaba.com, many competing products that could be sold from China are metaldehyde based, see “Comparing and Contrasting Similar Products Available from Canada” subtopic in the “Part I – Product Info” (Molluscicide, n.d.). Other products include Niclosamide based compounds, which are effective for killing golden snail apples on rice farms (Molluscicide, n.d.). According to the World Health Organization, Niclosamides are okay to ingest since very little of it is absorbed in the intestinal tract, and it also kills tapeworms (WHO, 2014). This only means that the active ingredient in the Niclosamide based molluscicides on Alibaba.com are safe for ingestion, since the composition of the rest of the molluscicide is unknown; there could be dangerous chemicals present in them.

### **Critical Summary**

Sluggo would be a solid competitor in Nepal as a molluscicide, and it is safer for the environment than many of its competitor products that are metaldehyde based. Sluggo is not affordable for the average family living in Nepal since about 30% of Nepalese civilians live on US \$14.00 per month; not enough to purchase Sluggo to cover a hectare of land. However, it is suitable for larger groups, neighbours or villages investing in Sluggo to stop an invasive species. It is easily applied and safe to handle, which means that spreaders are not necessary, but they would make the application easier. Overall, Sluggo is a solid product that would perform well in Nepal in the areas plagued by invasive mollusks, as well as areas surrounding the infestation areas.

### **Recommendations to Canadian Companies**

Although Sluggo is an exceptional molluscicide that is safe and effective, Canadian companies should be challenged to try to create more effective, cheaper products than Sluggo in Canada so that there is a competing product that is made, not imported, in Canada. Canadian companies that deal in insecticides and such should try to enter the international market and compete globally. By expanding, more business and revenue will be brought to Canada, thus stimulating Canada's economy.

### **Company Contacts in Nepal**

A potential buyer could be Arbind Agro Centre, located in Kalaiya, Nepal, phone number 977-53-550348 and the CEO is Sunil Kumar Sah (Business Portals, n.d.).

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