Project Title: Small Scale Root Crop Washer for McGill Student Ecological Garden
Budget Requested: 2000$

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I. Project Overview

The McGill Student Ecological Garden (MSEG) is a student run organization that operates on a 1 ¼ acre ecological farm on MacDonald Campus. MSEG applies sustainable agricultural practices to produce local vegetable crops.

Current practices involve a substantial amount of manual labor associated with planting, harvesting, and cleaning all the produce. MSEG has expressed the need for an innovative cleaning method that can effectively clean, produce and maintain this student-run organization’s level of environmental sustainability.

The goal of our proposal is to develop a small scale root crop washer that MSEG can implement such that they can greatly increase the efficiency and efficacy of the cleaning process while decreasing the amount of physical exertion required. The main focus of the design is to minimize water consumption requirements, eliminate electrical input, and increase efficiency of the operation. Innovation of the current system will decrease the time needed to move crops from the field to the local consumer.

Project eligibility:

A small scale root crop washer will allow MSEG to advance in their current agricultural practices. Already heavily focused on agriculture sustainability, the student-run organization will benefit from the design’s efficiency but there is also the potential to alleviate some of the water consumption stress of current methods of cleaning. Innovation of just one process, opens the door for better agricultural practices and a continued improvement towards agriculturally sustainable farming methods. This design solution would benefit the McGill student organization but also the many students who buy and consume this local, sustainable produce.

Timeframe/Milestones:

Finalization of Design Concept: Dec 3, 2013

Begin Construction: Jan 7, 2014

• Body construction, container housing the crops to be cleaned.
• Integration of power generating methods.
• Testing and further optimization.

Project Completion: March 31, 2014

Performance indicators:

The success of the root crop washer project will rest on the design team’s and the client’s positive interactions. Good communication is essential this project’s success. Understanding and working with MSEG is crucial to developing a feasible long term solution.

Resource management will play a large part in the development of a feasible solution; this will involve exchange of information to be integrated into our project, and other relevant matters. Ideally we want to improve upon MSEG’s current sustainability methods by improve
efficiencies. Therefore, logistics management will be an imperative performance factor to the success of this project.

Community Benefits:
The outcome of this project will hopefully help MSEG cultivate crops faster and more efficiently and promote them to grow more crops, or grow other types of crops. If successful we also hope this system can be implemented in rural countries, areas that depend on cultivating their own food and need their crops to be washed. These areas might not have access to enough water; if successful the system will help efficiently disperse the water in cleaning the crops, and minimize waste.

Stakeholders:
There are no other immediate individuals involved with the project although there a multiple mentors begin consulted throughout the process. Dr. Grant Clark is our main advisor with whom we will meet during the design and construction process. He will ensure that we are on track to meet out outlined timeframes and maintain feasible goals for the project. Dr. Michael Ngadi has been sought out as mentor for this project. He has an extensive background in food process engineering design and will be a source of invaluable technical expertise. Dr. Edward McKyes is another mentor we will be consulting for this project. His technical knowledge of machinery design will be a great source for the design of our solution.

MSEG will also be consulted on a regular basis as they are the main client. We have been consulting from the start of the project and they have shown interest in the project. They have been giving answers to our many questions, and have been providing information on their limitations and desirables considering the project.

II. Project Implementation

<table>
<thead>
<tr>
<th>Type of Activity - Task</th>
<th>Estimated Time</th>
<th>Member Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Container Assembly</td>
<td>2 weeks</td>
<td>Michelle Choi</td>
</tr>
<tr>
<td>Washing Components</td>
<td>2 weeks</td>
<td>Katherine Walker</td>
</tr>
<tr>
<td>Water Source Integration</td>
<td>1 week</td>
<td>Isabella Han</td>
</tr>
<tr>
<td>Power Source Development</td>
<td>1 week</td>
<td>Kourosh Mohtashami</td>
</tr>
<tr>
<td>Power Source Integration</td>
<td>2 weeks</td>
<td>Isabella Han</td>
</tr>
<tr>
<td>Optimization/Testing</td>
<td>2 weeks</td>
<td>All Group members</td>
</tr>
</tbody>
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Above estimate allow for 2 weeks slack in case of any unforeseen complication/production stalls.
III. Financials

- Critical Date: **January 14, 2014**

**Detailed expenses: 2000$**

<table>
<thead>
<tr>
<th>Expense Description</th>
<th>Estimated Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleaning Fixture (hoses, brushes)</td>
<td>200$</td>
</tr>
<tr>
<td>Gear components</td>
<td>300$</td>
</tr>
<tr>
<td>Building Materials (Lumber, screws etc)</td>
<td>1000$</td>
</tr>
<tr>
<td>Mechanical Fixtures</td>
<td>500$</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>2000$</strong></td>
</tr>
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</table>

**Detailed revenues:**

<table>
<thead>
<tr>
<th>Revenue Source</th>
<th>Amount Requested</th>
<th>Confirmed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainability Projects Fund</td>
<td>2000$</td>
<td>No</td>
</tr>
</tbody>
</table>

IV. Additional information:

As a group we bring various skill sets that allow us to be confident in undertaking this project. All of our group members are currently working toward a B.Eng in Bioresource engineering. We have taken a variety of course from electrical circuits and machinery to fluid mechanics as well as multiple environmental and agriculture based courses. The multi-disciplinary nature of our studies allows us to assess this project from both a mechanical design and agricultural sustainability view optimizing for the best possible solution. Furthermore one of our members, Kourosh Mohtashami, was one of the co-founding members of the McGill Ecological Student Garden. He has a good knowledge of how the organization functions and how designs of this nature can be applied to MSEG. We also have the benefit of having access to the extensive tools and machinery in the workshop located on the MacDonald Campus farm, giving us access to much of the construction equipment required to complete the project.