Team A22

Deliverable B - Needs Identification and Problem Statement

Engineering Design - GNG1103

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ABSTRACT

The purpose of this project is to develop a method to remove algae from plastic boards for the client Greener Hydroponics that can be done in an efficient timeframe. They have specified their needs, and they have been rated in terms of overall importance. The problem statement has been identified as: The client at Greener Hydroponics requires a simple, easy-to-use system (ideally automated) for their farmers to clean the algae buildup off of the polyurethane boards inside their portable hydroponic units.

1. Introduction

Greener Hydroponics is an Ottawa-based hydroponics farming company that is helping to make fresh vegetables in hard-to-reach places a reality. Greener has been enabling the growth of fresh produce in areas of Canada that would normally not be able to grow the vegetables that many in warmer areas of the country are accustomed to. The way Greener has been able to do this is by using modular indoor hydroponics facilities that can be easily set up and maintained in remote areas. Part of the maintenance of these facilities and their equipment is cleaning off algae growth from foam trays (and soon to be polyurethane) that suspend the produce on top of the water in which it grows. This process is time consuming and often not done to the needed quality due to the monotonousness of the task, especially if it is being performed at the end of a shift. In response to this, Greener Hydroponics is seeking a product that can reduce the time spent cleaning these trays that is simple to operate and is able to be stored in a reasonable amount of space.

2. Client Needs

During the first meeting with a representative from Greener Hydroponics, they expressed a need for a system that is able to reduce the amount of time users of their farms spend cleaning algae growth off of the produce trays. In addition to this, their representative expressed that the product in development needs to be relatively simple to operate owing to the fact that their clients are often not proficient in reading technical documents and instructions and never mind operating and maintaining complex machinery. With that being said an emphasis on the space taken up by this device was also made, however, with less importance relative to ease of use, overall effectiveness, and labor reduction. With regards to effectiveness, the representative from Greener Hydroponics stated that the desired cleanliness of the boards should be visually clean. This makes sense due to the fact that the device needs to be simple to use and not overly complex. The growing cycle of most vegetables on their farms is 4 weeks so the device used to clean the boards only needs to keep algae growth at reasonable levels between that interval. Also, it was

said that it is preferable if the trays are dry after the cleaning process as damp or wet areas promote more rapid algae growth. In an ideal situation the client is looking for an automated process for their farmers with “one-button click functionality” as opposed to painstaking manual labor currently required through hand brushing the boards. While understanding that it may be difficult to automate the process given constraints, other solutions to reduce manual labor, time and efficiency might also be considered. (ex. a solution which reduces the amount of algae growth to make it easier to clean)

Pictured below (Table 1) is a summary of the client’s requirements rated by their overall importance by utilizing stars, with more stars representing a higher level of importance.

Number	Needs of client	Level of Importance
1	Time Efficient for Farmers	★★★★★
2	Ease of Use	★★★★★
3	Cleaning Effectiveness	★★★★
4	Cost	★★★
5	Space Taken	★★
6	Time Efficient Process	★★

Table 1. Table of Clients Needs

3. Problem Statement

The client at Greener Hydroponics requires a simple, easy-to-use system (ideally automated) for their farmers to clean the algae buildup off of the polyurethane boards inside their portable hydroponic units.

4. Conclusion

We have concluded that the client needs us to develop a method for cleaning the polyurethane boards in a time-efficient and simple manner.