

Hydroponics

Best Practices on an Affordable and Beginner Level

Background

Gather on Trent is an all-seasons community support and wellness retreat located in Campbellford Ontario on the traditional and treaty territory of the Michi Saagiig Anishinaabeg. It operates with the goal of connecting individuals with themselves, their community and the environment in a healthy, sustainable way. Gather on Trent wants to implement a hydroponics system to help grow produce to share with its members and the surrounding community, making connections and providing nutritious environmentally-friendly produced foods.

A hydroponics system involves growing plants in water-based solution with minerals and nutrients provided for the growing plants. There are several different kinds of hydroponics systems, such as Deep-Water Culture, Drip Irrigation and Nutrient Film Technique. Each have their own aspects and abilities for growth.



Bunkhouse where system set-up will go. A 20 ft by 7 ft structure.



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Objectives

To provide suitable recommendations for Gather on Trent to help develop and maintain a sustainable, efficient and affordable hydroponics system that will provide both the community and the organization with produce and herbs.

Methods

1. A review of both grey and academic literature was conducted with key terms of: Hydroponics, Cost Effective Hydroponics and, Advantages of Hydroponic Farming.
2. Research was also conducted into the cost of different hydroponics set-ups and what system would be best to ensure a cost-effective set-up.
3. We contacted experts and performed market research on typical hydroponic systems judging them based on price, type, and productivity.
4. A site visit was conducted to gather information on where the best location on the property for the system to go.

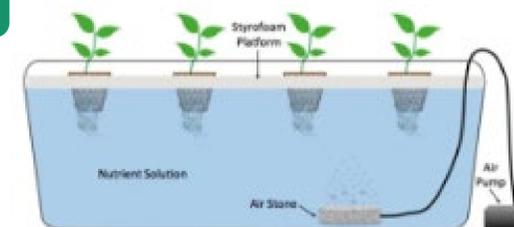
Findings

We recommend a Deep-Water Culture system (DWC) as it is the most resource-efficient and has a greater yield than even soil grown crops (Hamza et al., 2022). Compared to other methods of hydroponics, DWC is easier to maintain, easier to set up, and oftentimes cheaper (Espiritu, 2023). Due to these many factors, it is without a doubt that a DWC setup would be the most beneficial for Gather On Trent and in alignment with the interests of our host – being cost efficient and easy to maintain on a beginner level.



An Example picture of an active Depp Water Culture growth system

From: Espiritu, 2023. <https://www.epicgardening.com/deep-water-culture-get-started/>



Systematic model of a Deep-Water Culture system

From: Growace, 2021. <https://growace.com/blogs/learning-center/ebb-and-flow-vs-dwc-hydroponic-systems>

Deep Water Culture

Of the different hydroponics methods, DWC is the only one that involves directly placing the plant's roots in water with the leaves suspended above. Typically, this involves natural or chemical fertilizers in the water. Contrary to what may be expected, DWC is the most water-efficient method of hydroponics, and compared to drip irrigation or standard soil growth there is a noted increase in growth time (Hamza et al., 2022). This will allow for a faster turnover rate in production.

Since Gather On Trent's goals for crop growth involved leafy vegetables and water-intensive plants, DWC suits perfectly (Growace, 2021). Moreover, DWC is overall hailed as the most beginner-friendly and cost-effective hydroponics system through its simple and easy-to-set-up system (Growace, 2021).



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