

User Needs	Interpreted Needs
Cleaning system is simple to understand.	User Friendly, simple to understand
Cleaning system is relatively automated.	User can do other things while it cleans the rafts
It needs to be less than or equal 48" x72" if it's on the wall	Raft cleaner needs to be compact in size relative to the wall space
It needs to be less than or equal to 30" x 96" if it's on the table	Raft cleaner needs to be compact in size relative to the table space
The boards are cleaned	Raft cleaner effectively cleans algae of the boards
Reduce cleaning time below 6-8 hours a week	Raft cleaner is faster than it takes the farmers to clean them as of now
Cleans about 20 boards per week	Raft cleaner needs to be reliable during high loads (some days will have more rafts to clean than others)
Raft cleaner needs to be eco-friendly	Efficient water usage during the cleaning process Food safe/natural chemicals
Needs to last long	Raft cleaner must have a good longevity and be reliable to last long
Easy to fix/maintain	Problems can be fixed on the spot instead of having to call a maintenance person
Need to dry better	Raft cleaner needs to be more effective at drying the boards than a towel with a farmer

1: is highest importance, 5: is lowest importance

Groups	Needs	Importance	Explanation
Usability	User Friendly, simple to understand	1	We learned during the client meeting that this is their highest priority, so it is ours as well
	Problems can be fixed on the spot instead of having to call a maintenance person	3	They are mostly living in rural areas so it's difficult for them to get repairmen to help them, it'll be easier to fix it themselves. Worst case they can still call them so it's not the highest priority
Size Requirements	Raft cleaner needs to be compact in size relative to the wall space	2	It can always be smaller, it's most important to clean. If it goes over or under slightly but cleans perfectly its still working
	Raft cleaner needs to be compact in size relative to the table space	2	
Time Management	Raft cleaner needs to be reliable during high loads (some days will have more rafts to clean than others)	4	Farmer can always space out the days they wash the rafts, so they aren't all being cleaned on the same day. It's more important that the raft works
	Raft cleaner is faster than it takes the farmers to clean them as of now	4	It doesn't matter how long it takes as long as it's automated, it's nice that it goes quicker but it's not necessary

	Raft cleaner needs to be more effective at drying the boards than a towel with a farmer	5	It can save time, but the customers are still ok with the current solution of drying it with a towel
	User can do other things while it cleans the rafts	1	Crucial that the farmers can do other things while they clean so they don't have to spend 6-8 hours a week focusing on just cleaning the boards, drastically reduce the time
Eco-Friendly	Efficient water usage during the cleaning process	3	It's harder to have access to a lot of water in rural areas, plus it costs more money for more water and less eco-friendly
	Food safe/natural chemicals	3	Growcer website says No synthetic pesticides which is part of their core values so it's important to stay true to that, but also isn't as important as the function of the cleaner
Effectiveness	Raft cleaner effectively cleans algae off the boards	1	If it doesn't clean the boards, it doesn't meet the clients need to clean the boards.
	Raft cleaner must have a good longevity to last long	2	The farmer is spending a lot of money on it, so it needs to last long for the return on investment to be high

Problem Statement

A simple to use, compact, automated cleaning device is needed for farmers in rural areas to effectively clean the rafts of their eco-friendly hydroponic gardens that will last for many years.

User Perceptions

Review from a drill attachment that cleans algae from pools and boats (*Drill Brush Power Scrubber*, n.d.) "This drill attachment saved me so much time and effort this spring. I purchased the drill brush to use to clean my backyard pond. In the past, I would have to get down on my hands and knees to scrub the algae and grime off the sides of the pond liner. By using this attachment, my work was reduced to minutes...no scrubbing required. I would definitely recommend this product to others." (*Amazon Review 1*, n.d.) Spinning scrubbers will dramatically reduce time in our raft cleaner.

Review from a tabletop dishwasher (*Countertop Dishwasher*, n.d.) "It started out fantastic, it was a little powerhouse at first, but now it can't clean anything. Everything comes out with a weird residue that isn't soap scum and it can't even clean a cup. We've emptied the filter and run vinegar through it but it still reeks of mold. Don't buy this." (Zimmerman, n.d.) We need to make sure the filter for the cleaning device works properly so it doesn't become useless after a short period of time

Review from an UV algae light cleaner (*UV Light Algae Cleaner*, n.d.) "I wanted to love this. I put it in my sump and with in 3 days the bulb has a black tinge to the glass like it was in the process of burning out. The current in the bulb itself flickered and it just never worked right again. But for the 3 days it did work it was great!!!" (*Amazon Review 3*, n.d.)

Client Questions

How many rafts do you expect to be cleaned in a session (20 boards in a few hours or 20 boards over the space of a few days)?

What percent of customers care about water efficiency?

References

Amazon Review 3. (n.d.). Retrieved October 1, 2022, from [https://www.amazon.ca/Waterproof-Sterilizer-Submersible-](https://www.amazon.ca/Waterproof-Sterilizer-Submersible-Sterilization-Aquarium/product-reviews/B01JEBHHRY/ref=cm_cr_getr_d_paging_btm_next_6?ie=UTF8&reviewerType=all_reviews&pageNumber=6)

[Sterilization-Aquarium/product-](https://www.amazon.ca/Waterproof-Sterilizer-Submersible-Sterilization-Aquarium/product-reviews/B01JEBHHRY/ref=cm_cr_getr_d_paging_btm_next_6?ie=UTF8&reviewerType=all_reviews&pageNumber=6)

[reviews/B01JEBHHRY/ref=cm_cr_getr_d_paging_btm_next_6?ie=UTF8&reviewerType=all_reviews&pageNumber=6](https://www.amazon.ca/Waterproof-Sterilizer-Submersible-Sterilization-Aquarium/product-reviews/B01JEBHHRY/ref=cm_cr_getr_d_paging_btm_next_6?ie=UTF8&reviewerType=all_reviews&pageNumber=6)

Countertop Dishwasher. (n.d.). Retrieved October 1, 2022, from [https://www.amazon.ca/Countertop-Dishwasher-Washing-](https://www.amazon.ca/Countertop-Dishwasher-Washing-Programs-Portable/dp/B08SBR12S7/ref=cm_cr_arp_d_product_top?ie=UTF8)

[Programs-Portable/dp/B08SBR12S7/ref=cm_cr_arp_d_product_top?ie=UTF8](https://www.amazon.ca/Countertop-Dishwasher-Washing-Programs-Portable/dp/B08SBR12S7/ref=cm_cr_arp_d_product_top?ie=UTF8)

Drill Brush Power Scrubber. (n.d.). Retrieved September 30, 2022, from [https://www.amazon.ca/Kayak-Accessories-Barnacles-](https://www.amazon.ca/Kayak-Accessories-Barnacles-Oxidation-Inflatable/dp/B07KGJG4K4?th=1)

[Oxidation-Inflatable/dp/B07KGJG4K4?th=1](https://www.amazon.ca/Kayak-Accessories-Barnacles-Oxidation-Inflatable/dp/B07KGJG4K4?th=1)

Amazon Review 1t. (n.d.). Retrieved September 30, 2022, from

https://www.amazon.ca/review/RBKRC1V42PTA2/ref=cm_cr_srp_d_rdp_perm?ie=UTF8&ASIN=B07KGJG4K4

UV light algae cleaner. (n.d.). Retrieved October 1, 2022, from [https://www.amazon.ca/Waterproof-Sterilizer-Submersible-](https://www.amazon.ca/Waterproof-Sterilizer-Submersible-Sterilization-Aquarium/dp/B01JEBHHRY/ref=asc_df_B01JEBHHRY?tag=bingshopdesk-20&linkCode=df0&hvadid=80401879906321&hvnetw=o&hvqmt=e&hvbmt=be&hvdev=c&hvlocint=&hvlocphy=&hvta)

[Sterilization-Aquarium/dp/B01JEBHHRY/ref=asc_df_B01JEBHHRY?tag=bingshopdesk-](https://www.amazon.ca/Waterproof-Sterilizer-Submersible-Sterilization-Aquarium/dp/B01JEBHHRY/ref=asc_df_B01JEBHHRY?tag=bingshopdesk-20&linkCode=df0&hvadid=80401879906321&hvnetw=o&hvqmt=e&hvbmt=be&hvdev=c&hvlocint=&hvlocphy=&hvta)

[20&linkCode=df0&hvadid=80401879906321&hvnetw=o&hvqmt=e&hvbmt=be&hvdev=c&hvlocint=&hvlocphy=&hvta](https://www.amazon.ca/Waterproof-Sterilizer-Submersible-Sterilization-Aquarium/dp/B01JEBHHRY/ref=asc_df_B01JEBHHRY?tag=bingshopdesk-20&linkCode=df0&hvadid=80401879906321&hvnetw=o&hvqmt=e&hvbmt=be&hvdev=c&hvlocint=&hvlocphy=&hvta)

[rgid=pla-4584001428753542&psc=1](https://www.amazon.ca/Waterproof-Sterilizer-Submersible-Sterilization-Aquarium/dp/B01JEBHHRY/ref=asc_df_B01JEBHHRY?tag=bingshopdesk-20&linkCode=df0&hvadid=80401879906321&hvnetw=o&hvqmt=e&hvbmt=be&hvdev=c&hvlocint=&hvlocphy=&hvta)

Zimmerman, S. (n.d.). *Amazon Review 2.* Retrieved October 1, 2022, from [https://www.amazon.ca/Countertop-Dishwasher-](https://www.amazon.ca/Countertop-Dishwasher-Washing-Programs-Portable/product-reviews/B08SBR12S7/ref=cm_cr_getr_d_paging_btm_next_6?ie=UTF8&reviewerType=all_reviews&pageNumber=6)

[Washing-Programs-Portable/product-](https://www.amazon.ca/Countertop-Dishwasher-Washing-Programs-Portable/product-reviews/B08SBR12S7/ref=cm_cr_getr_d_paging_btm_next_6?ie=UTF8&reviewerType=all_reviews&pageNumber=6)

[reviews/B08SBR12S7/ref=cm_cr_getr_d_paging_btm_next_6?ie=UTF8&reviewerType=all_reviews&pageNumber=6](https://www.amazon.ca/Countertop-Dishwasher-Washing-Programs-Portable/product-reviews/B08SBR12S7/ref=cm_cr_getr_d_paging_btm_next_6?ie=UTF8&reviewerType=all_reviews&pageNumber=6)