Paul Oliver

**Interview Notes**

Goal: The goal is to collect information on watering and fertilizing routines of plant growers at various levels of experience and understand how a mobile application can mitigate any associated pain points with maintaining proper soil conditions.

Main Topics: 1. The current routine for watering and fertilizing plants.

2. Issues with watering and fertilizing plants.

3. Required information to support ideal soil conditions.

4. Impact of relative data provided by a mobile application.

Questions: 1. How do you currently determine when your plant(s) need to be watered or fed?

2. Have you ever had problems keeping the ideal soil conditions for your plants? How did you overcome them?

3. What information would you want to see in an application designed to help you with watering and fertilizing plants?

4. How could an application designed to check and communicate soil conditions help you with the plants that you are growing right now?

Notes:

*Interview #1* **–** Judy is a young professional in the tech industry and is in her early thirties. She only began gardening recently because of staying in from the pandemic. She found out that she really enjoys caring for plants and it is now her favorite pastime. At home she has flowers and vegetables outside. Just started legally growing cannabis indoors.

Determines soil conditions by sight and signs from plants. Outdoor plants are easier to care for. Mother nature does most of the work regarding soil conditions. Fertilizes outside a few times a year. Cannabis needs more attention. Uses fertilizer supplier’s suggested fertilizer schedule, but said it needs adjustments. When top of soil is dry knuckle deep she waters indoor plants. These require more attention. The indoor plants can be on different watering and fertilizing schedules which can be hard to track at times.

Has issues with soil conditions of indoor plants, but more so in the beginning. She uses less fertilizer than suggested by supplier and hopes for the best. She does not know the actual levels of any nutrient at any time. Looks up leaf issues on the internet to determine plant needs.

Would not be likely to use such an app for outdoor plant use because mother nature does most of the work. More interested in ability to read nutrient levels of indoor grown plants. Wants to track and schedule giving water and fertilizer. Wants to know how dry the soil is and if there are any excess or deficient nutrients. Suggests a meter with red and green colors to show level of important nutrients. Wants to write notes and for the issue to be determined for her instead of having to look online.

Would not stress out as much about plant health and save time researching. It would improve organization because right now she writes notes on the calendar app on her phone, but not often. There is no structure to her current process and she wishes she could take better care of her indoor plants but is doing “well-enough” for the time being. She would not want to pay for an expensive device that syncs with the application.

*Interview #2* **–** Tom is a retired schoolteacher that considers himself a seasoned gardener. Has been growing several types of flowers, fruit trees, shrubs, and aquatic plants outdoors for decades. Rarely ever uses fertilizer because of the rich soil where he lives. He only waters during the summer months when the ground is very dry. He knows a lot about plants and nutrients but does not monitor his own soil.

He only experiences issues with bugs and wildlife because he lives “out in the country” where they are abundant. Does not do anything to mitigate problems. Has fish in a pond to provide fertilizer for his plants. Developed an ecosystem to maintain a balance that supports the wellbeing of his plants. This is why he does not have many issues.

He does not need an application to help with his soil conditions but it would be interesting to know how the soil changes over time. He lives near a lot of farms and wants to know the impact of climate change on the soil. Suggests graphs to track these changes and emphasizes that they need to be easy to read. He would use this information to discuss soil conditions with the Ruritan club.

*Interview #3* **–** Larry is a retired construction worker. He just started growing cannabis when it became legal in Virginia and uses it for medicinal purposes. Emphasizes need because of work-related health issues. He only grows one plant at a time. He waters and fertilizes his plant every day. He starts fertilizing at a low amount and then gradually increases the amount as the plant matures. Larry says he does it this way because it has worked for plants in the past and ensures they are never dry or hungry. Does not think about excessive nutrient levels. He is confident in his process.

He only had soil issues when he first started out, but that was because he over fertilized in the beginning. That is why he starts with “very low” amounts of fertilizer in the beginning. Has never had issues with overwatering because he uses a fabric pot and only waters a small amount each day.

Despite his confidence, Larry knows he could improve his current system. He wants to add more nutrients to make his plant yield better. He would want the application to make sure he does not over fertilize and burn his plants after introducing new nutrient supplements. Suggests an alert that will tell him to stop adding more of a nutrient. Said that the pH level is important. Wants to see overall soil condition, then a breakdown of different areas that make up overall soil condition (water, pH, Nitrogen, etc.). He has concerns about security and how the application will get its data. He wants to keep his data private. If there is a device, how will it communicate with the mobile application through Wi-Fi or Bluetooth.

*Interview #4* **–** Kara is in her forties and a registered nurse. Every year she grows herbs and vegetables for her and her family. Some of the plants that she is growing this year she are rosemary, dill, tomatoes, and spinach. She has a sprinkler system that waters her backyard (including garden) every night. She says that it is turned off when it rains hard and during a wet spring. She plants her herbs and vegetables using soil that has fertilizer already in it and applies additional fertilizer twice during the grow season. Some plants do better than others; bigger vegetables and better fragrance for herbs. All plants get the same amount of fertilizer and watering.

She has had issues with some plants not producing vegetables at all or producing only small vegetables. She is not sure what exactly causes these problems. It seems that some plants will do well and some will not. She thinks using a different fertilizer could help or using more of the current one.

She want an application to tell her what she needs to change in her current system to get the best vegetables. She does not have a lot of free time to spend on her plants so the application should monitor the plants for her and tell her what to do. Does not want to log into the app all the time. Would like to be alerted when she needs to do something. She wants to know what the specific nutrients needs for each plant are and how well the soil is providing them at any moment. She wants to be able to see all of her plants at once and to focus on individual plants. She likes the idea of a meter but not cartoon-like characters. She wants to share the progress of her vegetables and herbs with her church friends via social media, including pictures. She is not tech-savvy so she suggests that the app be intuitive and have helpful resources available if needed. She wants to be able to take notes using her phone’s microphone capabilities and would prefer the application work offline.

She thinks an application that checks on her plants for her will help her spend more time doing other things. She can change her fertilizer as needed to improve conditions for herbs and fertilizer. She would know where to give more or less nutrients so that final product is “big and delicious”. She thinks a mobile application that can communicate soil conditions for individual plants would be popular among her and her friends. She would want her kids to be able to use it too so that they can begin to learn to garden.

**Interview Analysis**

Initially, most interviewees expressed hesitancy toward using a mobile application to monitor moisture content and nutrient levels. The interviewees were confident in their current method for determining when their plants needed to be watered or fertilized. However, they became more open to the concept once we began discussing what they would like to see in it. Security and data retrieval were issues mentioned that were not considered beforehand. Some interviewees were curious about how the mobile application would get data on soil conditions and how their data would be protected. Manually entering data into an application is time consuming and can negatively impact the application’s usability. Interviewees do not want to share their data, especially those growing certain plants.

Interviewees emphasized the need for the application to be easy to use and for the dashboard to show comprehensive, pertinent information on the soil conditions for their plants. Interviewees that expressed an interest in the mobile application for indoor growing were more interested in the ability to view data for multiple plants at the same time. For outdoor growing, the pattern was to view a sort of high-level overview of all plants being monitored. This was most likely because the plants outdoors are inground and, therefore, all have similar soil conditions. Cannabis growing was a theme among the interviews. Recently, Virginia made it legal for residents to grow cannabis and the popularity has been increasing. This type of growing is new for most people and some of the people interviewed expressed an interest in using the mobile application to help them in this unfamiliar territory and requested that the pH be displayed and monitored too. It is important to point out that the interviewees did not have positive responses to the use of cartoon-like characters with facial expression in the design of the mobile application. They would appreciate a more professional, mature design that is not overly colorful.

The keywords that were mentioned the most often were “easy”, “track”, “balance”, “burn”, and “meter”. Learnability and memorability are important usability goals for the interviewees. The keyword “easy” was used to describe the layout and functionality of the application. Interviewees, surprisingly, were not interested in excessive functionality. They want the application to track and display soil conditions. Simplified functionality on the user’s end and proper element placement can facilitate those goals. The keyword “track” was used to describe desired functionality from the mobile application. Interviewees want to see their past progress to learn from and better understand what happened when something goes wrong. They keyword “balance” was used to describe outdoor growing and they way that nature can balance the needs of plants. It was also used as a goal for interviewees when discussing using the mobile application. There is a desire for the mobile application to provide a balance within the soil that helps their plants. The keyword “burn” was used to describe nutrient burn which occurs when a plant is overfertilized. Interviewees would like to use the application to make sure that they do not over feed their plants because it can cause damage and impact growth. The keyword “meter” was used to describe the way the interviewees want to see the levels of nutrients. A meter would show users where a measurement falls within a range. It was suggested that the application would be more useful that way instead of showing only the measurement.

The user properties that can be identified are mature, not necessarily older, individuals that grow plants for food or medicinal purposes. Geographically, users are located in urban areas where the soil is less nutrient dense and there is limited room to grow outdoors. The users of the mobile application use fertilizer as a part of their plant care routine. The users are passionate plant people that are within 20 to 60 years of age. A typical user has some experience with gardening and soil conditions but is not an “expert” or master gardener. A user does not have a lot of time to dedicate using the application. Their lack of experience and availability hinder their ability to interpret soil conditions and plant needs, but it is important to them. Another user property is that they are a part of the working class, which explains time constraints and provides them the ability to afford the mobile application or the possible associated device to read soil conditions.

**Target Audience**

Based on the interview analysis, the target audience of the mobile application design is college-educated and between 23 and 45 years old. These individuals are gainfully employed and middle to upper class with busy careers. The income range has high variability. However, they are able and willing to afford an associated cost within reason to use the application. They do not have a work background with plants. Professionally, the target audience consists of blue and white collar workers. They have schedules that strain their availability to care for their plants and check soil conditions.

The target audience are avid plant growers with little to moderate experience with checking soil conditions and growing plants. They would like help improving the current condition of their soil because they know that it could be better but are not sure how. They need to know when and how their soil conditions are not ideal so that they can respond with water or fertilizer. The target audience are indoor and small outdoor garden growers. They grow plants for food and medicinal purposes. Their goal is to use the mobile application to improve yield and quality. They also want to know how soil conditions change over time. The target audience desires quantitative data that measures soil moisture content, nutrient levels, and pH. They need to be able to access a high level overview when checking soil conditions for multiple plants and a low level overview for a specific plant. Another goal of the target audience is to save time. Using the mobile application to monitor soil conditions can be done anywhere, at any time without having to physically check. The target audience can balance their busy lifestyles because the do not need to check their beloved plant(s) all the time. They expect the mobile application to inform them when they need to do something.

The target audience engages with the mobile application on their personal mobile device at any time of the day, but usually during and after work. Typically, they will spend about 10 minutes on the mobile application to check soil conditions, depending on how many plants they are monitoring. The mobile application is checked multiple times a day because changes can occur as the day progresses. Checking during work allows the target audience to respond after work when an issue occurs. The mobile application is engaged with after responding to an issue to ensure that it has been resolved.

**User Persona**

Marlena is a 42 year old contractor and owns a business that works with commercial developers on projects. She is college educated, earns more than $100,000 a year, and is married with children. She recently began growing herbs and vegetables to teach her children about sustainability. She has never tried her hand at gardening so taking care of plants is knew to her. Her family grows their plants in the small backyard of their home in the suburbs. They grow some plants inground and others in raised beds. Since her job is very demanding, both physically and mentally, she does not have a lot of free time to check their garden. She wants her family’s herbs and vegetables to turn out well so that the children take more of an interest in the activity and their meals will taste better. She thinks that the application is a simple solution to track the soil conditions for her family’s many herbs and vegetables. She appreciates being notified when she needs to water a plant or add fertilizer so that she does not need to check herself and guess all the time. She uses her iPhone 13 Promax to check the application at work if she has a break and notices. Otherwise, she checks after work. She mostly checks the application with her young children. She likes that the application is easy enough for them to use and understand.

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Aaron is a 24 year old junior systems analyst that recently graduated from college. He is single and lives alone with his cat, Scoops, in an apartment in the city. He earns $62,000 a year and invests what he can. He has been growing legal cannabis for a few years now and considers himself an experienced grower. He has had issues with his plants in the past because of over fertilizing and watering. He tries to stick to the fertilizer manufacturer’s recommended feeding chart, but it will sometimes cause a plant’s leaves to change strange colors. He grows one plant at a time and uses the application to identify excessive and deficient nutrient so that he can adjust his fertilizer appropriately. He loves that he can view the pH level so that he can add supplements to raise or lower it when necessary. The application has given him the confidence and assurance to try new fertilizers to see if they work better than the one he has used since he first started growing. The well-being and growth of his plants are main concerns of Aaron because of its medicinal purpose. He first checks the mobile application in the morning then many times throughout the day and into the evening. He checks the application on his Galaxy S22 Ultra at home, work, and while out with friends. He likes to share the progress of his plant’s growth with his college friends that don’t live that close. Table

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**(Owlsmcgee, 2019)**

References

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