

GROWERTALKS

Under an Acre

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A Scientific Approach to Growing

Anne-Marie Hardie



Growing is far from a straight and narrow path—along the way, there are many hurdles, shifts and sometimes roadblocks.

No one knows this better than Sandra Carrico, owner and operator of Bay Area Fresh in Mountainview, California, who launched a small-scale hydroponic business to offer a healthier, sustainable alternative to her community.

“I’m primarily known for my basil—it’s what I grow best,” said Sandra. “My basil product is so different from anyone else’s on the market, the leaves are three times bigger and it is so fragrant.”

Pictured: Sandra Carrico launched Bay Area Fresh in Mountainview, California, a small-scale hydroponic business specializing in fresh basil.

If the basil isn’t selling, Sandra will casually walk through the farmers market shaking the freshly picked leaves. The scent entices shoppers to stop by and purchase a plant or two for their own home.

“I could move two dozen basil plants in half an hour, simply by sharing the scent of the plant,” she said.

A software engineer by trade, and currently the VP and Chief Data Scientist at Glynt.ai, Sandra turned to growing to diversify her activities and to research a few of the major challenges in the food industry, including food safety and water shortages. She immediately began exploring hydroponic systems and whether this growing technique could potentially be the solution to these challenges.

“We were in the midst of a bad drought in California and moving to hydroponics, which used a fraction of the water and fertilizer, simply made sense,” she explained.

During the first year, Sandra conducted detailed research on hydroponic growing with a particular focus on water savings and avoiding runoff. She then designed a system using a research grant to help fund the start-up costs,

including purchasing the necessary equipment.

Although hydroponics is typically more of a monocrop, Bay Area Fresh's experimental design allowed for Sandra to grow several varieties of basil and lettuce. She also experimented with indoor and outdoor growing techniques, taking advantage of the pleasant climate in the area.

"I had no idea which crop I would be better at, as I hadn't grown in this way before," said Sandra.

Discovering the right hydroponic solution for the company has been an ongoing journey. Bay Area Fresh has taken a very scientific approach to growing, including collecting data and continually seeking out ways to improve the operation.

"When it comes to hydroponics, it's important to test different methods on a small scale before you invest your money into a single solution," said Sandra. Over the years, Bay Area Fresh has tried a variety of hydroponic solutions, running experiments against each other to discover which one was most effective for both the specific crops and the environment.

Food safety remains one of the primary concerns for Sandra and she's continually looking at ways to decrease these risks. Although she does add nutrients to her plants, Sandra is extremely cautious about the inputs that she adds to her system.

"You have to be very careful about moving fertilizers into the hydroponic environment; the research may result in more expensive inputs, but it is so important for food safety," she said.

The journey hasn't been without its challenges, including root diseases and power outages. Bay Area Fresh runs its water through numerous carbon filters and a UV to ensure that all water that's in contact with the plants is contaminant-free. But Sandra's discovered that, despite these practices, there's still the risk of root diseases.

"Using a single reservoir for water can spread root diseases, which in practice tends to roughly occur every seven to nine months," she said.

With a small operation, such as the one at Bay Area Fresh, she identified that one strategy to mitigate this risk would be working with several reservoirs instead of one. Currently, the company is testing the effectiveness of the reconfiguration.

At the same time, power outages in California have forced Sandra to take a detailed look at the infrastructure of her operation. This includes seeing which areas would benefit from back-up generators and looking at alternate methods that could be used to help the system endure during power outages.

To respond to these challenges, Sandra has made the decision to take a step back and fully reconfigure her system to one that's more resilient. This includes a multi-month plan to better manage the power outages and to isolate root diseases more effectively.

"I'll retain a smaller version of the old method for seed germination and raising for the first few weeks, but after that I'll split them out into the new system," she said.

That being said, she advises individuals who are launching into this sector to start out small and slowly transition into a full-time operation.

"Be sure that you still have a day job when you start out," she said. "Hydroponics takes time to discover what works well in your environment—it is truly situational."

For those looking into getting into hydroponics full time, Sandra recommends having several separate grow rooms running at the same time, ideally five, but two should be the bare minimum. This format would provide growers with

the ability to clean one room while continuing to grow produce in the others.

For Bay Area Fresh, they plan to remain on the smaller side of the operation.

“I suspect a single person could run a five-grow-room operation on their own if they focused on the business full time,” said Sandra. “But that’s simply not a practical choice for me, as I’m highly spaced-constrained and still maintain a full-time job.” **GT**

Anne-Marie Hardie is a freelance writer/speaker from Barrie, Ontario, and part of the third generation of the family-owned garden center/wholesale business Bradford Greenhouses in Barrie/Bradford, Ontario.