

Vegetable Cookery-Hydroponics

While visiting McWethy hydroponics farm in Michigan I was intrigued with the possibilities that this growing method may offer. Many people have the misconception that hydroponics is a recent discovery, but it is in fact fairly ancient dating back to the hanging gardens of Babylon. Hydroponics literally means working water, but in this application it refers to the growing of plants in the absence of soil.

The water used to grow the plants with is extremely important and the entire hydroponics process begins with the pond. Water from the pond is filtered through a sand filter and is transferred to the main house via the pump house. Inside the main house the water is filtered again and softened with a water softener and is then purified through reverse osmosis. The reverse osmosis makes the water highly susceptible to pH changes so a small amount of sodium bicarbonate is added to set the pH. The water is then pumped into two 5,000 gallon tanks for holding. The water is next ready to have the vitamins and minerals added. One benefit of hydroponics is the fact that the mineral and vitamin content of each batch of water can be altered depending on the crop it is to be used for. Plants use different amounts of vitamin and minerals depending on light intensity, temperature, and humidity and the solution can be altered to compensate for this. The nutrient stock solution can be mixed and held for 3-4 months.

The first step of growing the plants starts in the seed room. The seed room has heated tables and supplemental light which helps to protect the young plants from extreme changes in environment. The plants are started in a rock sponge. The rock sponge is made by melting rock and then spinning the melted rock into thin fibers. This process reminds me of how cotton candy is made. The rock sponge has an amazing ability to retain a large amount of water as well as air. Once the plants begin to grow they are transplanted into long enclosed troughs. These troughs have a slow trickle of nutrient water passing through them. This is called the nutrient film technique.

After the plants are large enough to move to the main house they are transplanted into a medium called Perlite. Perlite is volcanic rock that is popped like popcorn. The plants in the greenhouse are planted side by side to efficiently utilize the vertical space. The plants are trained vertically and are moved around the row as they grow in height. This produces an impressive coil of 45-50 ft tomato plants hanging from the rafters. Only 4-6 feet of foliage is needed to sustain the plant. The foliage is trimmed into this 4-6 foot range but if too much foliage is removed the plants ability to hold water is lessened and the fruit will pop due to too much water. The farm also produces fresh herbs such as basil. These plants are grown in vertically stacked planters called Vertigro. The nutrient water is pumped to the top planter and eventually passes through each planter as it comes to the bottom.

An advantage of hydroponic growing is the fact that there is no soil and the greenhouse can be maintained as a sterile environment so there is little to no risk of food borne illnesses. The greenhouse can also be used to control the majority of pests so any pests in the greenhouse can be eliminated with natural predators. At McWethy Farms white flies damage tomato crops and carry viruses but Todd orders parasitic wasp larvae which hatch and attack the whiteflies and lays eggs inside of it. These larvae hatch and feed on the insides of the whitefly then crawl out to infect more whiteflies.

Hydroponic farming is a more efficient more green way to grow a variety of fruits and vegetables because it actually reduces water usage compared to a traditional farm with the same output. Because the plants are grown quickly and efficiently the output of McWethy Farm's 1/4

acre greenhouse is comparable to a 5-6 acre farm. The fruits and vegetables grown hydroponically are generally much more nutritious than their traditionally grown counterpart. The quality of the fruits and vegetables are also better because on a traditional farm the fruit and/or vegetable is cut and then sits out in the sun for a up to half a day or more. The size of the greenhouse allows the fruits and vegetables to be harvested and taken into the cool room to be graded and wrapped in less than an hour. This allows Todd to maintain the right temperature for the produce right up until it is sold to the chefs. It is important not to let the produce sit outside such as on a traditional farm because the produce's temperature rises very quickly once harvested, nearly 15 degrees almost immediately after harvesting. Hydroponic farming is also better on carbon emissions due to the lack of heavy machinery. Todd also had ideas about alternative energies to power the lights and other electric devices in the houses. A down-side to hydroponic farming is the large initial investment to get the farm running. The benefits of hydroponic farming are numerous and I hope that with time and more research it will be more accessible so that if I were a chef in the city I could grow my own fresh produce on the roof of the restaurant.