

Student Pioneer Demonstrates Hydroponics at Eco Centro

Graciela de Leon is truly a pioneer of hydroponics at the William R. Sinkin Eco Centro of San Antonio College with nearly three years of experience. Support for her efforts was first derived from the DOE Re-Energize and USDA EverGreen sub-grants with Texas State University. In order to overcome visitor access limitations to the interior of the hydroponic shipping container, Graciela saw the need to create an external hydroponic system that by means of which visitors can easily view the components of a hydroponic system and see it in operation. One of the primary goals of the Eco Centro hydroponic project is to use low-cost materials that would be available in developing nations. You can see from the photo on the right that the materials used by Graciela are readily available and relatively inexpensive.



The nutrient tank for the project is made from a 40-gallon food grade plastic container. Reflective insulation sheeting and structural materials surrounding the tank protect it from temperature extremes. An opening at the top of the tank provides easy access for adding nutrient solution or monitoring solution traits. Instruments used for nutrient monitoring include electroconductivity, pH and temperature gauges. A pump pushes nutrient from the tank to the top of the vertical growing channels which are filled with bird netting through which the nutrient flows.



Graciela's hydroponic project includes a tray-style grow area in addition to the vertical channels. The photo to the right shows her holding a siphon that she uses to pull nutrient up from the storage tank and into the tray. The siphon is housed in the turquoise-colored tube that is perforated to allow nutrient to flow in and out of the growing medium. Nutrient that cycles through the tray will feed the roots of plants that protrude downward through the pellets. Plants growing in the tray will generally be taller than those that are attached to the vertical channels. In all cases, edible leafy plants will be grown in the project in support of the overarching goal of bringing food production closer to the location where it will be consumed.

Components used to control the quality and quantity of nutrient flowing through the system are the filter, which Graciela is holding in the photo to the left, and the flow control valve inserted into the tube directly below that. The system pump pushes water through the with relatively low pressure and the adjustment valve regulates the flow rate. The filter's ability to remove particulate impurities from the solution reduces the frequency which the nutrient solution needs to be replaced. After passing through the filter, the nutrient solution rises to the top of the vertical channels where it is released channel by channel and flows down through bird netting to reach the plant roots. From the bottom the channels it flows back to the storage tank.

