Portable Hydrogarden

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Hydroponics is a method of growing plants that involves the use of a water-based solution and inert medium such as perlite or peat moss to support the root system as an alternative for soil. The main aim of this project is to further improve this agricultural method in order to minimize the expenses of operating facilities in indoor farms. The hypothesis, which states that a portable and vertical hydroponic system made from recycled materials will be more effective to use for growing plants than a standard hydroponics system or conventional planting in soil, was supported by the results obtained. After creating two models of a design that functions via the use of a portable pump and is independent of controllers such as those required to measure pH and humidity, it was found that the systems can lead to a significant reduction in water and energy consumption. This is chiefly because the water circulating throughout them is recycled, thus does not have to be constantly changed, and the pumps used to push it in the system are rechargeable or work on solar energy as well. Furthermore, both designs are space efficient, meaning able to produce more lettuce plants per square meter, and the return of investment time for varying selling prices of lettuce grown in them is extremely minimal. The use of recycled pipes and plastic cups in the manufacturing of the products also minimize costs. Such factors in turn reduce expenses and verify my hypothesis as well. For this reason, when compared with other planting methods, my model has proven to overall be much more advantageous and profitable.

Awards Won: