The Hydro-Aeroponic Crops, an Alternative Technique in Agriculture

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Hydroponic and aeroponic systems aim to reduce soil usage and degradation while increasing production, nonetheless both systems depend on fertilizers, demand considerable amounts of energy, and their cost/benefit relation is low, comparing to traditional agricultural systems. Moreover species rotation is difficult in hydroponics and nutrients transport mechanisms such as osmosis are weak in aeroponics (therefore it is mainly applied to plant species with low nutritional requirements). Aiming to create an improved system we used computer tools for modeling and drawing (AutoCAD and SolidWoks) in the development of an aeroponic system that incorporates two processes from the hydroponic: NTF (Nutrient Film Technique), and aquaponics (integrated production of aquaculture and hydroponics in a symbiotic environment). We call this new system “Hydro-Aeroponics”. The proposed system is composed of a hydroaeroponic chamber, an aquaculture structure, and a filtering and pumping system. In this scheme the water that is enriched with nutrients that are the byproduct of fish metabolism is then filtered to separate solid residues and taken to the plants’ roots, which absorb nutrients and is finally chemically filtered to return to the aquarium. The system will be tested with Lactuca sativa (local variety know as Batavian). The concentration of nitrates in the leafs will be measured by colorimetry, and nitrate salts in the water will also be measured to assess the performance of the system.

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