



CLIMATE-SMART URBAN AGRICULTURE

SUPPORTING HISTORICALLY UNDERSERVED PRODUCERS



WHAT IS AN AQUAPONIC DEEP WATER CULTURE SYSTEM?

Aquaponic production is a mode of growing that provides organic produce. Aquaponics is unique compared to hydroponic production as it combines interactions of fish, plants, bacteria and the environment (Shafeena, 2016). Aquaponic production is a growing industry with substantial demand for organic produce driving the market (Aquaponics, 2022). Generally, it is thought that aquaponics may present benefits in sustainability using natural processes, instead of sourcing chemical fertilizer. Utilizing fish waste converted by the nitrification process to usable nitrogen this

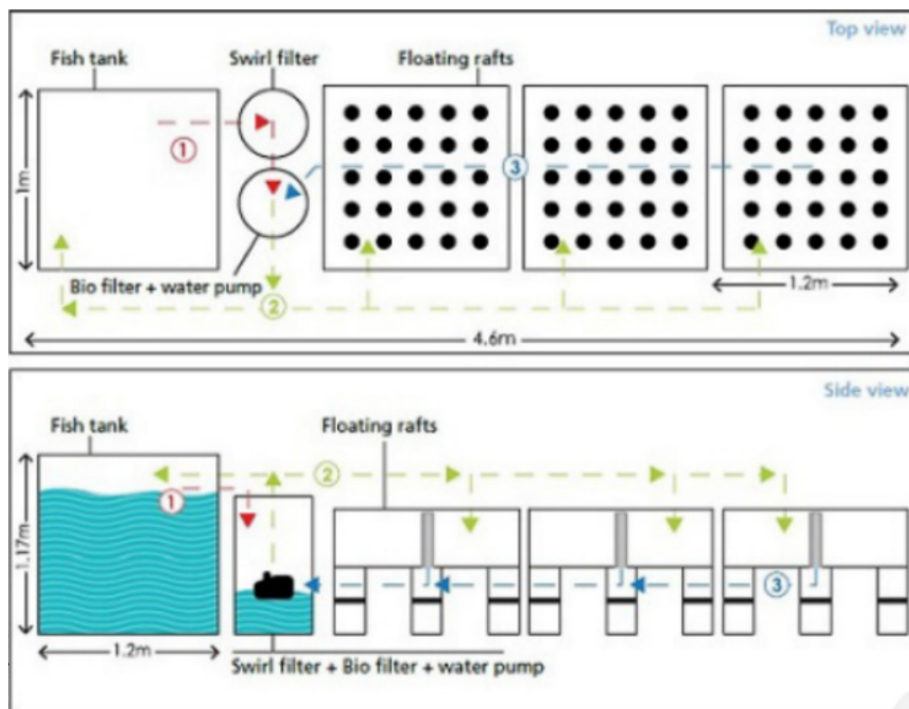
nitrogen may be undertaken by basil roots. Deep Water Culture or (DWC), also known as the raft method or floating system, allows for floating rafts to be transplanted and roots to be submerged in aquaponic water (Shafeena, 2016). Combining aquaponics and DWC allows for scalable aquaponic greenhouses, with reduced maintenance compared to other growing methods such as drip irrigation, and less complex engineering than Nutrient Film Technique (NFT) systems. This makes DWC aquaponics a great choice for commercial or home growers.



WHERE & HOW IS THIS USED?

Indoor and outdoor growing facilities may utilize aquaponic DWC growing. Specifications may vary for pond sizes depending on available space. Aquaponic water is piped into ponds, after fish waste

solids have been removed and bio-filters have converted nitrogen. This process can be a closed looped system utilizing aquaponic water for a long duration.



Retrieved from Food and Agriculture Organization of the United Nations

BEST PRACTICES

A culmination of factors allows for high quality organic and quantity of organic produce. Air stones and oxygenation systems should supply oxygen into organic ponds providing oxygen for healthy root development. Stocking density and variety of fish effects levels of available nutrients. It is also important to

consider that fish food protein percentage generally is regarded with a positive relationship between percentage and nutrient output. Make sure the aquaponic water is never still in your DWC ponds, this will prevent buildup and allow for solid wastes to be broken down even more for plant uptake.

DRAWBACKS & CONSIDERATIONS

Maintaining a proper balance between environments for optimal plant growth, and fish health in a linked system is a common struggle for aquaponic growers. Proper pH for fish generally is higher than optimal growing pH in a DWC system. A

relationship between plants and fish exists in the natural world, as aquaponic growers we use minor adjustments driven by data to maintain that balance that is naturally found.





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