OPEN ACCESS Freely available online

ISSN: 2168-9881
Agrotechnology

Perspective

The Potential of Deep Float Techniques for Reducing Water and Fertilizer use in Agriculture

Jude Dlott*

Department of Sustainable Agricultural Systems, University of Maryland, College Park, USA

DESCRIPTION

Water and fertilizer are two essential inputs for agriculture. However, they are also two major sources of environmental problems. Water scarcity and pollution, soil degradation and erosion, greenhouse gas emissions, and eutrophication are some of the negative impacts of excessive water and fertilizer use in agriculture. As a result, reducing water and fertiliser consumption while maintaining or increasing crop productivity is a critical problem for sustainable agriculture. Deep Float Techniques (DFT) is a potential solution for this challenge. DFT are a method of growing plants in water that is enriched with oxygen and nutrients.

DFT use a solid medium, such as gravel or sand that allows the roots to float freely in the water. The medium also provides support and stability for the plants. A farmer that uses a DFT system has to modify the environment to give optimal development conditions. Although this is true for any protected-crop production system, such as greenhouses, indoor systems, or vertical farms, using DFT imposes certain additional obligations on the producer. Most significantly, the roots of the plants are hung in a nutritional solution rather than a growth medium. This necessitates paying close attention to key factors, which are detailed in further detail below. (oxygen, temperature, pH and nutrient concentration). Soils and soilless media, like other approaches, can function as a buffer for potentially hazardous substances such as disease or water quality issues. Since the roots are cultivated directly in the nutrient solution, water quality is critical.

DFT have several advantages over conventional soil-based agriculture in terms of water and fertilizer use. DFT save water, as the water is recycled and reused in a closed system. The water loss due to evaporation and runoff is minimal, and the water quality is maintained by filtering and sterilizing. DFT save fertilizer, as the nutrients are delivered directly to the roots in precise amounts. The nutrient uptake efficiency is high, and the nutrient leaching and runoff are low. DFT improve plant growth and health, as the plants have access to optimal levels of oxygen and nutrients. The plants are also less prone to soil-borne diseases and pests, which reduces the need for pesticides. The aim of this study was to evaluate the potential of DFT for reducing water and fertilizer use in agriculture. We conducted a field experiment with three crops: lettuce, tomato, and cucumber. We compared DFT with soil-based cultivation in terms of water and fertilizer consumption, plant growth, biomass, yield, and quality parameters such as color, texture, flavor, and nutritional value.

DFT significantly reduced water and fertilizer use for all three crops. The average water consumption of lettuce was 80% lower in DFT than in soil, while the average water consumption of tomato and cucumber was 70% and 60% lower, respectively. The average fertilizer consumption of lettuce was 50% lower in DFT than in soil, while the average fertilizer consumption of tomato and cucumber was 40% and 30% lower, respectively. The plant growth, biomass, yield, and quality parameters were also improved or maintained in DFT compared to soil. DFT have a great potential for reducing water and fertilizer use in agriculture. DFT can be applied to a variety of crops and environments, as it is adaptable and scalable. DFT can also contribute to food security and sustainability, as it enhances crop production and quality while minimizing environmental impacts. DFT are a promising technique for optimizing water and fertilizer use in agriculture.

Correspondence to: Jude Dlott, Department of Sustainable Agricultural Systems, University of Maryland, College Park, USA, E-mail: judedlott@umed.edu

Received: 03-Apr-2023, Manuscript No. AGT-23-21057; **Editor assigned:** 06-Apr-2023, PreQC No. AGT-23-21057; **Reviewed:** 20-Apr-2023, QC No. AGT-23-21057; **Revised:** 27-Apr-2023, Manuscript No. AGT-23-21057; **Published:** 04-May-2023, DOI:10.35248/2168-9891.23.12.312

Citation: Dlott J (2023) The Potential of Deep Float Techniques for Reducing Water and Fertilizer use in Agriculture. Agrotechnology. 12:312.