

SPOTLIGHT: AN INTRODUCTION TO "BIOPONICS" AND CONTAINERS

INTRODUCTION

'Bioponics' and containerized production are a significant topic of discussion at this Fall 2016 NOSB meeting in St. Louis, MO. Hydroponics, aeroponics, aquaponics, bioponics, and containers are all buzzwords that are used to describe different production systems, but what do these various terms and definitions mean, and what do these systems look like?

'BIOPONICS'

NOSB is considering whether 'bioponic' production systems align with organic regulations and principles, and uses the term 'bioponics' to describe a spectrum of operations that grow crops without the use of solid media like soil (in the case of in-the-ground production) or coco coir or peat moss (in the case of containerized production). Within this soil-less spectrum, crops can be grown with their roots immersed in or exposed to microbial-active, nutrient-rich, water solution (hydroponics and aeroponics), or they can be grown in combination with fish whose waste is transformed into plant-available nutrients by microbes present in the system (aquaponics). Historically, hydroponic, aeroponic, and, to some extent, aquaponic systems have relied on conventional plant-available fertilizers to bypass the need for biology in these systems. Innovative growers, however, have figured out how to maintain an adequate population of microbes in these systems to allow the use of natural fertilizers allowed in organic production. The term 'bioponics' refers to this entire spectrum of soil-less growing that maintains a sufficient level of biological activity to grow crops using only fertilizers allowed in organic farming.



Hydroponic production



Aeroponic production



Aquaponic crop production



Aquaponic fish production

CONTAINERIZED PRODUCTION

Containerized production is a somewhat easier production system to picture. These systems grow crops in containers, and supply nutrients through the combination of solid fertilizers mixed into the growing media as well as liquid fertilizers delivered through irrigation systems. As with 'bioponics,' containerized production must ensure that adequate biology is present to convert the natural fertilizers into a form available to plants. Growers are finding additional water-saving and land-conservation benefits from growing in containers, and this style of production is being used to produce vegetables, such as tomatoes, peppers and cucumbers, as well as small berries, such as blueberries and raspberries.



Containerized production of (above) blueberries and (below) tomatoes



LOOKING FORWARD

We likely will never see widespread adoption of 'bioponics' or containerized production to grow crops that require large acreage, such as grains, simply because these systems are complex and capital-intensive and currently only lend themselves to the production of higher-value specialty crops like fruits and vegetables. However, as producers face growing challenges of water and labor availability, land scarcity, and a growing urban population, these innovative production systems may provide a solution to some of these challenges. As these systems prove to be successful, there is a growing adoption of 'bioponics' and containerized production in urban settings. Urban agriculture has the potential to address food sovereignty issues for densely populated areas, and this potential has prompted Ranking Member of the Senate Agriculture Committee Debbie Stabenow of Michigan to introduce the Urban Agriculture Act of 2016 to Congress—which aims to create new economic opportunities and increase access to healthy foods. Regardless of NOSB's recommendation on 'bioponics' and containerized production in organic, these systems will be a permanent and increasingly prominent feature of the future of the world's food supply.