



AQUAPONICS

Aquaponics to the rescue

Big demand for urban agriculture and an institutional desire to support these farms bode well for the US aquaculture industry

BY TREENA HEIN

“I am going to tell you something that you already know intuitively, that aquaponics is helping to rebuild the US aquaculture industry,” Dr George B. Brooks Jr tells the audience at the Aquaculture America 2018 conference in February in Las Vegas.

Brooks is an adjunct faculty member in the Department of Agriculture at Mesa Community College in Phoenix, Arizona and is actively involved in the evolution of urban agriculture and business development in the city.

Brooks noted that in the 1990s the US aquaculture industry was in serious trouble. There was an ageing workforce, difficulties in finding employees, a lack of new young entrants, a dearth of innovation and a reduction in extension programs. Then came the huge planes that enabled extensive low-cost imports, disrupting the business model for fish and seafood in the United States.

However, Brooks believes domestic production of fish and other species can recover in the US, and the market is huge. In a post on ‘The Aquaponic Gardening Community’ forum in November 2017, Brooks



Credit: Lucky Clays Fresh

Aquaponics projects benefit communities through increased food security

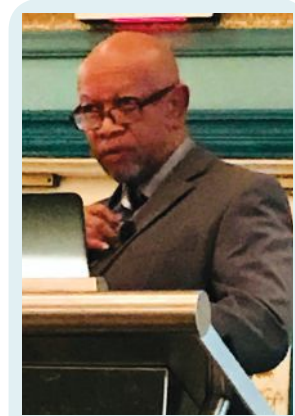
stated that “the United States currently only produces 10 percent of the seafood it eats,” producing about 500 million lbs of the 5 billion lbs that’s consumed annually. “For us to

just increase that by 5 percent of the total would require an additional 250 million lbs of product,” he stated, which is “far from impossible.” He says “millions of dollars are now being devoted to reviving our industry. The only question is what role will aquaponics play?”

Brooks believes that it will play an important role across the nation, and shared many signs of progress during his Aquaculture America 2018 presentation. As an example, he pointed out that in Wisconsin, the number of aquaculture farms has recently jumped from 2,300 to 2,800, with 300 of the 500 new farms being aquaponics operations. In Brooks’ home city of Phoenix, large organizations like Vitalyst Health Foundation are actively supporting aquaponics and other types of urban farming because, he says, the products “can provide health, healthy neighbourhoods, healthy people.”

Municipal leaders, adds Brooks, in cities like Phoenix and Boston, so badly want urban agriculture that “we are now able with new techniques to bring this directly into the city, whether that’s a community garden, urban farm or a vertical garden... Everyone can have a farm, whether it’s in your backyard or an urban space that couldn’t become anything else.”

An aquaponics demonstration project proposal was recently put before Phoenix city council, and the Phoenix Office of Environmental Programs was recently awarded a \$400,000 grant from the US Environmental Protection Agency to remove hazardous substances from brownfield properties and to redevelop them in ways that improve public health, including aquaponics, hydroponics, controlled environment, community and school gardens. In Phoenix as well, Mesa Community College has a ‘Center for Urban Agriculture,’ which promotes “healthy eating and living through sustainable urban agriculture, aquaponics, and local food production.” Brooks says his aquaponics courses are overbooked.



Dr George Books Jr of Mesa Community College believes aquaponics will play an important role across the US. His aquaponics courses are overbooked

Over 40 Years of Fish Health Excellence

Syndel Canada | 800-663-2282 syndel.ca
Syndel US | 800-283-5292 syndel.com

TREATMENTS

ANESTHETICS

SPAWNING

ANTIMICROBIALS

BIOSECURITY

NUTRITION



Catfish fingerlings being slowly introduced into their new home at Dahlia Campus for Health & Well-Being
Credit: Jenna Smith



A student at UWSP tempers saugeye fingerlings into a new system at the Aquaponics Innovation Center in Wisconsin. Around 60 percent of new farms in the state are aquaponics operations, says Brooks
Credit: Emma Wiermaa

At the same time progress is being made, much remains to be accomplished for aquaponics and aquaculture in Brooks' home state and beyond. "In Arizona," he says, "we are seeing increasing new farms, farmers of all ages, an institutional desire to support these farms and successful training programs, but we need new system designs, a processing hub, new species, we need an experimental station, and we need more access to capital."

Kentucky poised to be a major player in aquaponics farming

Kentucky has deep roots in agriculture but growing economic pressures and the 1980s farm crisis led to the quiet disappearance in the number of family-run farms. The roughly 20-percent decline in the number of Kentucky farms between 1995 and 2015 further compounded the economic disparity in both rural and urban areas. Farmers looking to reinvent the state's agricultural landscape led to the emergence of nine aquaponic businesses over the past seven years.

Aquaponic food production systems attract new and seasoned farmers due to its inherent sustainability and consumer demand for year-round, high-quality local produce. Many areas in the region are considered prime locations due to excellent groundwater, available land, close proximity to urban markets, and incentives to businesses for purchasing locally grown produce. However, farmers face a significant learning curve with aquaponics, the biggest hurdle being temperate climate. The added cost of insulated building/greenhouses, heating, and lighting are major obstacles for profitability.

"For the past five years, Kentucky State University's (KSU) aquaponics program has worked to address these challenges through research, Extension and academic efforts. The Aquaculture Research Center in Frankfort is at the forefront of this mission," said Janelle Hager, Research Associate at KSU's Aquaculture Research Center.

She added: "Current and potential producers have been able to achieve a realistic perspective on the ins and outs of temperate culture. In response to regional needs, the most pressing issues that producers face are being addressed, including profit potential, reducing operating costs, and food safety. Extension efforts focus on working directly with farmers to bolster farm economics and business planning."

Aquaponics is shaping up to be a strong alternative farming practice in Kentucky. In response to this demand, KSU has expanded its aquaponics course offerings with an online program for both undergrad and graduate students. The online classes have attracted 965 students from 40 states and 27 countries over the past 10 years.

"It's the only graduate-level online aquaponics program in the country. Sustainable agriculture practices have taken root across the country and Kentuckians are ready to get their hands wet," said Hager.

KSU's aquaponics Fall semester class started in August with 15 students enrolled. Additional details for the aquaponics program is available at www.ksuaquaculture.org



Butterhead lettuce growing on aquaponic trays, with Nile tilapia underneath, at KSU's Aquaculture Research Center

PERMALON® AQUACULTURE LINERS

UV STABILIZED

RESIST PUNCTURE AND TEARS
FOR A MORE SECURE SYSTEM

LIGHTWEIGHT AND
EASY TO HANDLE

CUSTOM ENGINEERED
FABRICATION & SIZES UP
TO AN ACRE



AQUAPONICS

Farms with a view



The 4,000-m² rooftop aquaponics farm in Brussels by BIGH currently grows only striped bass. Credit: Isopix/Le Lardic

The large amount of waste energy that buildings generate has inspired a Belgian aquaponics company to build its farms on rooftops

Ferme Abattoir is arguably Europe's largest productive rooftop garden. The greenhouse and outdoor garden measure 4,000 square meters combined.

Located in the heart of Brussels, Ferme Abattoir is the first urban farm of Building Integrated GreenHouses (BIGH). The company builds rooftop aquaponic farms, which benefit from different fluxes (heat, water, wind) from the buildings and reduce their environmental impact. The idea is not unique to BIGH; there's a similar operation in New York, which sits atop an eight-story apartment building.

BIGH's farm, built on the roof of the Foodmet market hall, features a state-of-the-art aquaponic system with fish, vegetables and herb in a closed and zero-waste loop.

The company is currently focused on building urban farms in major cities in Belgium, France, Luxembourg and Italy, but it is looking at expanding beyond Europe.

"BIGH is in negotiations with partners capable of supporting international development in the UK and, potentially the US, including new technologies combined with the current model. BIGH will work on reasonably large projects integrating circular economy/cradle-to-cradle integrated approach," BIGH founder Steven Beckers told *Aquaculture North America (ANA)*.

CREATING QUALITY WATER

Looking for a Better Solution?

Pro-Tect
UV SYSTEMS
By RK2



System Features:

- Non-Corrosive schedule 80 PVC reactor bodies are stronger and handle higher internal pressures compared to HDPE and Polypropylene. Schedule 80 reactor bodies are seawater safe and will not corrode in harsh environments, unlike stainless steel
- Single end glassware access makes for easy maintenance when replacing lamps and quartz sleeves
- Thermoplastic or Fiberglass NEMA 12 Power supply enclosures with Standard HMI control package or optional HMI Pro Series control package.
- Electronic ballasts matched to the performance of the specific lamp for optimal UV-C output and longest useful lamp life
- Standard Over Temperature Safety Cutoff Switch thermally protects reactor when water temperature reaches 120 Degrees F
- American made low pressure amalgam (ALH/AUH models) and high output (HLH/HUH models) lamps are rated 80% efficient at the end of 12,000 hours

760.746.7400 • www.RK2.com • sales@RK2.com



Protects your stock. And your budget.

The specially formulated PVC of Plastatech® FG geomembrane provides a flexible, durable tank and pond liner with no known toxic effect on aquatic species. It offers unsurpassed tensile strength, flexibility and lay-flat characteristics and is ideal for factory prefabrication — which can reduce installation time and cost.

Learn how Plastatech can fabricate a liner to fit your needs:

800-892-9358
plastatech.com/fg

*Reference your local and federal containment regulations for complete compliance requirements. Plastatech is a registered trademark of Plastatech Engineering, Ltd. | Plastatech is proudly manufactured in the USA.

Plastatech®
Film, Fabrics, and Laminate Solutions

Contain. Control. Comply

