Minnesota Aquaponics Symposium
April 24, 2018  |  St. Paul Campus, University of Minnesota
aquaponics.umn.edu

Schedule
8:30 am  Registration
         breakfast and coffee
9:15    Welcome - Alex Primus
9:30    Water Quality in Aquaponics
         Matthew Smith, Ohio State University
10:05   Fish Health in Aquaponics
         Alex Primus, University of Minnesota
10:40   Break
10:50   Aquaponics Plant Production
         Marie Abbey, University of Minnesota
11:25   Urban Organics: Bringing Local Fish and Produce to
         Restaurants, One Brewery at a Time
         Lee Scoggin, Urban Organics
12:00 pm Lunch and student poster session - Pomeroy 213
         Boxed lunches by Nelson's Cheese and Deli
1:30    Walk to Plant Growth Facilities
1:45    Hands on demonstrations
         Water quality testing equipment & procedures
         Fish health assessment procedures
         Plant health, production, and pest management
3:15    Closing remarks
3:30    Optional tours of aquaponics facilities

Sponsored by:
North Central Regional Aquaculture Center

Presented by:
CENTER FOR ANIMAL HEALTH AND FOOD SAFETY
University of Minnesota
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PRESENTERS

Alex Primus, DVM, PhD
UNIVERSITY OF MINNESOTA

Alex is an Assistant Professor in Fish Health at the University of Minnesota’s College of Veterinary Medicine. In this role, Alex provides support to local, regional, and international stakeholders in the aquaculture industry through a mixture of research, diagnostics, extension, and teaching. With over 15 years of professional experience in fish health management, veterinary diagnostics, fish vaccine R&D, and biomedical research, he is dedicated to the promotion of sustainable aquaculture practices and the development of innovative fish health management strategies.

Matthew Smith
OHIO STATE UNIVERSITY

Matthew started as the Extension Aquaculture Specialist for Ohio State University in 2016. Matthew has spent a considerable time on fish farms learning about the Ohio industry, transferring the latest technology, and working towards expanding and streamlining operations. He earned his Bachelor’s in Fisheries Management from Auburn University and his Master’s in Aquaculture and Fisheries from the University of Arkansas at Pine Bluff. If you want to chat with Matthew please contact him anytime at smith.11460@osu.edu or 740.289.2071 ext. 121.

Marie Abbey
UNIVERSITY OF MINNESOTA

Marie became interested in aquaponics after taking the first undergraduate aquaponic class offered at UMN in 2015. After graduating in 2016 with a BS in Plant Science she was hired as a masters student by Dr. Neil O. Anderson and Dr. Chengyan Yue to study aquaponic systems. Marie graduates this spring with an MS in Applied Plant Science and will continue to enjoy the Twin Cities area.

Lee Scoggin
URBAN ORGANICS

Lee received his B.S. degree from University of Wisconsin Stevens Point in Water-Resources and Aquaculture. Previously, he was the facility manager at Aquaterra Farms, in Bristol, WI, managing the commercial RAS production of Arctic char. He specializes in salmonid production and has extensive knowledge on fish health, water filtration, large-scale RAS systems, system install and design. He has helped manage several hatcheries and aquaponic systems at both the state and private level. Currently, he is the RAS manager at Urban Organics, a commercial cool-water aquaponics facility located in St. Paul, MN.

SPECIAL THANKS

Demonstration assistance: Neil Anderson, Jessica Coburn, Michele Schermann
Technical support: Ryan Rupprecht
Audiovisual support: Sarah Swanson, Kelly Vallandingham
Boxed lunches from Nelson’s Cheese & Deli
THE EFFECTS OF LOWERED PH ON THE PRODUCTIVITY OF FISH AND PLANTS IN AN AQUAPONIC SYSTEM
Anna Bride, Elliott Bussey, Hanna Hudepohl and Andrew Heiserman

EXECUTIVE SUMMARY: Aquaponically grown plants frequently face nutrient deficiency due to the alkaline conditions maintained. Growers often prioritize fish and microbe requirements at the expense of plant health and maturity. One way to improve subpar plant yields is to operate the system at a lowered, more favorable pH to better address plant needs. In this case, both the microbes and fish must be able to survive within the new parameters. This chapter investigates the possibility of operating an acidic aquaponic system replete with bacteria isolated from acidic soils, and blackwater fish native to the low pH waters of South America. Two tanks will be maintained at pH 6.0 and two tanks will be maintained at pH 7.5. Cardinal tetra and neon tetra fish populations will be added to each individual tank so both species can be compared across the two different pH levels. We expect that the blackwater fish will be able to support the microbe and plant populations by producing an appropriate amount of ammonia to drive nitrification. Nitrogen use efficiency (NUE) will be analyzed to determine how effectively the system is utilizing nitrogen inputs. Due to the more favorable conditions, we anticipate that the parsley plants grown in the lower pH system will report higher leaf counts, greater NUE per plant, and overall improved health compared to the plants grown in the higher pH system.

ELUSIVE CATCH: USING AQUAPONICS TO GROW STURGEON AND WILD RICE
Jace Galley, Laura Mathews, Joe Ramstad and Harrison Roessler

EXECUTIVE SUMMARY: Emerging as an alternative source of agriculture, aquaponic and hydroponic systems are quickly becoming established across Midwestern communities. Despite this, research of aquaponic and hydroponic practitioners has not maintained the same rate of growth as the industry itself. This survey will help to fill the knowledge gap surrounding the current status of aquaponic and hydroponic professionals within the Midwest. Data collected will include demographics, system size and location, economic sustainability, as well as motives and perceptions within each industry. Due to the lack of current research this proposed study represents an unprecedented opportunity to understand the current status of these emerging industries. Analyzing this data will reveal current trends and help define the main challenges facing each industry.

REDUCING EXTERNAL NITROGEN INPUTS THROUGH USE OF ALTERNATIVE FOOD SOURCES IN AQUAPONICS TILAPIA SYSTEMS
Morgan Hardy, Heidi Schlinsog, Emily Swanson and Thor Lohn

EXECUTIVE SUMMARY: This proposal addresses a new concept that attempts to close the nitrogen cycle within an aquaponic system. Achieving a reduction in the amount of external nitrogen inputs through the use of internally produced alternative food sources shows potential to lessen the environmental impact of standard fish meal-based feeds. This system is environmentally beneficial because we do not have the use of chemicals and processed pellet food that must be made for the fish, this practice will be sustainable within one's own system. The production of fish feed within the aquaponics system allows for more control of the system by using materials already at hand, as well as reducing costs incurred through obtaining external sources of N. The proposed study will take place over a duration of 12 months. During this time, duckweed (Lemna perpusilla), and mealworms (Tenebrio molitor) will be analyzed for their viability as fish feeds in comparison to a standard pelleted fish meal-based feed for blue tilapia (Oreochromis aureus). 200 tilapia will be tested to collect data on the responses of these fish to 4 different food sources. Proportions of food sources tested will consist of: Tank 1- fish meal-based pellet feed only; Tank 2- 50% standard pellet and 50% duckweed feed; Tank 3- 50% standard pellet and 50% mealworm feed; and Tank 4- 50% duckweed and 50% mealworm feed. It is anticipated that this study will demonstrate that the growth of tilapia increases more rapidly with a diet of 50% plant matter and 50% insect meal, in comparison to the other treatments.

WHY ARE AQUAPONICS AND HYDROPONICS THRIVING IN MIDWEST BUSINESSES?
Matt Johnson and Christiana Vor

EXECUTIVE SUMMARY: Emerging as an alternative source of agriculture, aquaponic and hydroponic systems are quickly becoming established across Midwestern communities. Despite this, research of aquaponic and hydroponic practitioners has not maintained the same rate of growth as the industry itself. This survey will help to fill the knowledge gap surrounding the current status of aquaponic and hydroponic professionals within the Midwest. Data collected will include demographics, system size and location, economic sustainability, as well as motives and perceptions within each industry. Due to the lack of current research this proposed study represents an unprecedented opportunity to understand the current status of these emerging industries. Analyzing this data will reveal current trends and help define the main challenges facing each industry.