



REQUEST FOR PRE-PROPOSALS

Please Copy and Distribute to All Interested Parties

The USDA-NIFA Southern Regional Aquaculture Center solicits a response from qualified multi-state teams interested in participating in the regional project:

Optimizing Production Systems for Removal of Ammonia

SRAC's Board of Directors has authorized up to \$200,000 for a 2-year project on *Optimizing Production Systems for Removal of Ammonia*. This project will be developed using the "comprehensive method" where a team of multi-state scientists having demonstrated records of expertise in the subject complete a single pre-proposal that addresses all project objectives. One proposal will be selected for funding based on review by a committee of scientists not involved in any of the proposals that are submitted.

Background

Feed is the main source of nitrogen that enters pond aquaculture systems. Approximately 75% of nitrogen from feed will enter the water as ammonia, where it is converted into the phytoplankton bloom, remains as ammonia, or is transformed into nitrite and nitrate. Ammonia can be removed from the system as nitrogen gas or denitrification, but otherwise it will remain in the system either limiting carrying of the pond or causing mortalities. Fish appetite decreases and feed conversion increases with high ammonia among all fish species, leading to higher costs of production, increased growout time, and diminished profits. Furthermore, ammonia spikes have been implicated as a factor in the onset of disease outbreaks, potentially leading to catastrophic fish mortality

The potential for elevated ammonia seems to be different among pond production systems and the underlying factors for this remain unclear. Intensive aquaculture production systems are increasingly used to achieve cost efficiencies. However, nitrogen cycling in these systems is not well understood. Determining how the different types of production system impacts ammonia accumulation is relevant among all aquaculture industries that use earthen ponds.

Objectives

1. Determine if the rate and pattern of ammonia accumulation is different in split-pond and intensively aerated production systems.
2. Characterize the underlying mechanisms that contribute to ammonia accumulation, transformation, and removal in split-pond and intensively aerated production systems.

Experimental Approach

Hybrid catfish production in split-ponds and intensively aerated ponds will be evaluated under commercial rearing conditions. During this period, basic production data and repeated

measurements will be taken to determine if these systems handle nitrogen differently. Characterizing dissolved oxygen profiles, quantifying rates and concentrations of nitrogen transformations, and utilizing metagenomics and bacterial enumeration/profiles to describe the microbiota of should be used to describe differences between these production systems.

How to Respond

Pre-proposals must address all objectives. Preference will be given to pre-proposals that show a high degree of collaboration and coordination among participants. To meet the criterion for a regional project, the pre-proposal must include collaboration from scientists in two or more states or territories in the Southern Region (Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, Puerto Rico, South Carolina, Tennessee, Texas, U.S. Virgin Islands, and Virginia).

The pre-proposal must include a one-page vita for each participant and a proposed budget for each participating institution or organization. Pre-proposals, vitae, and budgets that are not in the proper format will not be considered. See “Guidelines for Writing a SRAC Pre-Proposal (Comprehensive)” file attached or contact Kristen Walters with the SRAC office at 662-686-3269.

Send an electronic copy of the pre-proposal in Word format to Jimmy Avery, SRAC Director as an email attachment (jimmy.avery@msstate.edu) by **August 15, 2022**. Proposals received after that date will not be considered.