TARGETED REQUEST FOR PROPOSALS SUBMISSION
DEADLINE EOB 1/16/2024

TRFP TITLE: CHARACTERIZING IMPACT OF IRRIGATION WATER QUALITY ACROSS BOTH GEOGRAPHY AND TIME ON NUTRIENT USE AND YIELD OF MS SOYBEAN

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PROPOSAL DEADLINE: EOB 1/16/2024

INTRODUCTION:
The Mississippi Soybean Promotion Board (MSPB) focuses on investing Mississippi checkoff dollars to develop and promote soybean and soybean production to improve the bottom-line potential for soybean farmers. The MSPB strategy is to leverage funds and partner with public and private entities to address production research, identify market opportunities, and communicate the outcomes to Mississippi soybean farmers and industry influencers.

PURPOSE OF TRFP:
MSPB is trialing a framework through which it can more effectively invest checkoff dollars on behalf of Mississippi soybean growers. That framework will utilize Targeted Requests for Proposal (TRFP). The strategy of TRFPs is built upon identification of comprehensive General Focus Areas (GFAs). The GFA is a general agronomic subject matter with high interest of growers and industry. A single TRFP is tied to a single GFA. The GFA is further divided into Specific Research Targets (SRTs) which correspond to the 'scope' of the more comprehensive GFA. Proposals should be directed to address one or several of the SRTs. The intentions of the framework include: 1) shift a portion of research focus and budget spend from present issues and impact and toward near-term (5 year) and longer-term (10 year) efforts and impacts, 2) develop a greater proportion of funded research that is unique, new, and likely to accentuate MSPB funded research within the soybean industry, 3) encourage collaborative efforts across disciplines for a better understanding of key issues, and 4) close some of the gap between current research and focus areas of early-adopters in the state.

BACKGROUND & PURPOSE OF PROJECT:

Vast acres of MS soybean acres are grown under irrigation. Irrigation water sources vary from tailwater recovery pits, manmade reservoirs, and natural surface waters but most irrigation water is pumped from below ground. Also, while there are some acres of pivot and flood irrigation, most acres are furrow irrigated.

Many testimonials exist, and historical data to some extent will support the fact that in years with ample rainfall and minimal irrigation, irrigated soybean yields are higher than years heavily reliant on irrigation. Various possible explanations exist, one of which is the quality of the irrigation water.

Recent years have seen advancements in understanding irrigation water, particularly in green houses or high value crops. Nanobubble technology is currently being evaluated, and some results are promising both on crop response and equipment preservation. Reverse osmosis has also shown promise in high value crops with less-than-ideal quality water.

Another recent advancement has been utilization of saturated paste tests (and variations of these tests). These tests provide some degree of understanding of what is happening in the soil in the short-term (such as following an irrigation). The application can provide understanding of what nutrients are soluble in the soil and are available for plant uptake.

While yields are significant in the irrigated areas of Mississippi, surrounding areas consistently outperform MS on the high-end even on similar soil types and fertility levels. One potential reason for this 'lag' could potentially lie in the irrigation water itself.

The purpose of this CFA/TRFP is to create an understanding of the irrigation water quality from different sources in different geographies of MS. Further, an understanding of how this quality changes throughout the year and what impact that water quality has on crop performance is desired. Finally, the TRFP would like to identify any means to ameliorate said water quality problems identified.

Expected outcomes should include, but are not limited to:

1) Adequate survey of irrigation water quality by source, location, and time.
2) ID components of irrigation water that have the greatest impact on nutrient uptake by MS soybean.
3) ID what, if any, components of irrigation water impact soil biology and function in MS soybean production.
4) Recommendations for potential improvements to any quality problems identified.

TARGET AUDIENCE:
The target audience is both the MS soybean growers and those who influence soybean production in MS.

SPECIFIC RESEARCH TARGETS (<u>Proposals to include one to several SRTs</u>):

1) *Conduct a survey of irrigation water sources across MS.*
    a) Geography
    b) Source (well, river/lake/stream, tail water recovery, reservoir)
    c) Evaluate (pH, soluble salts, Ca/Mg/Fe concentrations, carbonates, other elements)
2) *Repeat this survey throughout the year.*
    a) Testimonials indicate this quality changes.
    b) Plants under pivots appear to be iron stained by mid-summer.
3) *Investigate what impact different sources have on soil nutrient uptake (required before and after irrigation cycle; also required throughout the year).*
    a) Saturated paste tests
        i) Water and soil for key locations of survey
    b) Plant growth and nutrient uptake
        i) Crop biomass and plant tissue testing
    c) Biological presence and function
        i) CO_2 burst and genomic testing.
4) *Evaluate opportunities to improve irrigation water success.*
    a) Reverse osmosis
    b) Nanobubble technology
    c) Fertigation opportunities

ADDITIONAL CONSIDERATIONS:

The contractor is expected to work with MSPB and BBRC and maintain regular contact throughout the contract period.

DELIVERABLES

Completion Date	Description of Deliverables
October 15, 2023	Posting of TRFPs
January 16, 2024	Submission of Proposal
February 6, 2024	Revision of Proposal (if necessary)
February 20, 2024	Funding
March 15, 2024	Verbal Check In
June 15, 2024	Field Visits, Short Summary to Date
October 15, 2024	Q4 Preliminary Review, Data Sharing
December 1, 2024	Yearly Analysis in PPT Form
December 31, 2024	MSSOY.org Postings

RFP TIMELINE:

- TRFP distribution: October 15, 2023.
- Last day to submit questions: January 16, 2024
- Initial project proposals due: January 16, 2024
- Selections made: February 20, 2024
- Prospective contractors notified: February 23, 2024

INSTRUCTIONS:

Please email proposals to research@mssoy.org by January 16, 2024.

Proposals must contain at a minimum the specific criteria listed below:

1) A description of PI's capabilities, resources, and experience. Emphasis should be placed on experience related to this RFP.
2) A thorough proposal outlining PIs' planned work, deliverables, and timeline to complete the work focused on Research Specific Target(s).
3) Detailed budget: all bids for services must provide a breakout of how the fee was derived including but not limited to a breakdown of hourly rate and the amount of effort they anticipate doing the work.
4) Proposals should be no longer than 10 pages (8 ½" x 11").