

Request for Proposals (RFP) Research and Demonstrations on Impacts of 4R Nutrient Stewardship

4R Nutrient Stewardship is a new, innovative approach to fertilizer best management practices adopted by the world fertilizer industry. This approach considers economic, social, and environmental dimensions of nutrient management and is essential to sustainability of agriculture systems. The concept is simple: apply the right source of nutrient, at the right rate, at the right time, and in the right place. However, the implementation of these practices is knowledge-intensive, site-specific, and is likely to change as new technologies become available and our understanding of nutrient management evolves. More information on the technical aspects of 4R Nutrient Stewardship is available at <http://www.ipni.net/4R> and on 4R industry programs at <http://www.nutrientstewardship.com/>.

The objective of this RFP is to solicit proposals for field research and demonstration projects evaluating and promoting the economic, social, and environmental impacts of 4R Nutrient Stewardship. Projects must address at least one of the 4Rs in addition to rate (preferably all four) for optimal agronomic management and impact on local environmental challenges such as water body nitrate levels or P loads and eutrophication. Impact indicators measured should be scalable and include system productivity and environmental effects such as those listed in the projects requested section of this RFP. Recognition of system and site interactions on the effectiveness of specific 4R practices will be important, including interactions among cultural practices such as rotation, genetics, tillage, nutrient-nutrient interactions, cover crops, etc.

Projects Requested:

Research and demonstration projects should examine one or more of the following topics related to 4R Nutrient Stewardship (right source, rate, time, and place):

1. **Economic, Social, and Environmental Outcomes** - For specific crop management systems, compare the impact of high yielding, 4R Nutrient Stewardship to current conventional practices with respect to productivity and profitability per unit area; **plus one or more of the following:**
 - a. mass balance (nutrient inputs, soil/crop pools, transfers, and losses from the crop-soil system) for specific nutrients, especially N and P;
 - b. crop nutrient uptake and nutrient use efficiency;
 - c. soil C, N and P retention or storage;
 - d. dissolved and particulate N and P loss through tile drainage, leaching or runoff;
 - e. ammonia emission losses through volatilization and nitrous oxide emissions via denitrification or nitrification;
 - f. changes in soil health (e.g. soil organic matter, water infiltration, water holding capacity, soil biology)
 - g. changes in receiving water body biotic integrity or trophic index (includes nutrient concentrations, BOD, etc.);
 - h. changes in field, farm or watershed ecosystem services;
 - i. other socio-economic factors.
2. **Improving 4R Nutrient Stewardship** - Refine practices that are currently perceived to be part of 4R Nutrient Stewardship relative to the crop-soil system's ability to produce the desirable outcomes listed in topic number one.
3. **Interactions with Site Conditions and Cropping Systems** - Explore the interactions among fertilizer source, rate, time, and place factors as affected by soil resource, climate, and cropping system factors in impacting one or more of the outcomes listed in topic number one. The 4R Fund has also issued an RFP for meta-analyses on this topic with expected project duration of 6-9 months. Those interested in research in this topic area are encouraged to consider first submitting a proposal for meta-analysis of the literature.

Desirable project features include:

1. **Multiple outcomes beyond field boundaries.** Proposals that simultaneously evaluate economic impacts and environmental effects beyond field boundaries will be given priority.
2. **Focus on specific challenges.** Projects focused on specific environmental challenges will be especially attractive. Examples of such challenges include water quality in a specific receiving water body that is currently impaired or atmospheric emissions from crop-soil systems believed to currently be high emitters.
3. **Collaboration with on-going activities.** Due to the high costs of the types of projects being requested as well as the substantial lag effects that are common for some environmental metrics (e.g. downstream or ground water quality), augmentation of on-going projects (such as inclusion of additional measurements or metrics) are highly encouraged. Projects that bring together multiple disciplines to address the multifaceted aspects of a particular research endeavor will receive higher priority as will projects with evidence of leveraging of 4R Fund support with other funding sources.
4. **Industry involvement.** Partnering with growers, the fertilizer industry, Certified Crop Advisers, and others involved in commercial production is strongly encouraged.
5. **Outreach activities.** Proposals should include specific details about how the information developed in the project will be communicated to the appropriate audiences.
6. **Project management.** Proposals should include a brief description of how the project will be managed to assure that milestones/deliverables are achieved.

Requirements:

1. The proposal:
 - a. should be presented in 12 point font, 1" margins, single spacing;
 - b. may not exceed 15 pages in length including: references, a one page budget summary, a time line/milestones table, and a list of deliverables;
 - c. must limit payment of indirect costs by the 4R Fund to no more than 10% of the total budget;
 - d. must not exceed 5 years in length;
 - e. should include a one page abbreviated resume for all key personnel (not counted in the page limit);
 - f. proposals should be submitted to the International Plant Nutrition Institute at ppates@ipni.net by close of business on **January 31, 2014**.
2. Submission of annual progress reports and a completion report, presentations at 4R Fund Review meetings, and submission of one or more peer-reviewed publications.
3. Data generated by 4R Fund projects must be submitted for inclusion in an open access 4R Fund project database, in a format that will be subsequently determined and prescribed. Original sources will be credited.

Award limitations:

Projects will be considered for funding to a maximum annual budget of \$300,000/year for no more than 5 years. However, to be competitive at levels approaching this maximum funding level, a project will need to be truly exceptional in its potential for major impact. Proposals with annual budgets under \$50,000 are anticipated and encouraged. Funds will be allocated annually based on successful completion of milestones/deliverables. The Fund anticipates awarding a minimum total of \$500,000/year in response to this RFP.

