Request for Proposals
Iowa Department of Agriculture and Land Stewardship

Water Quality Initiative
Planning & Development Projects

Proposals are Due:
NO LATER THAN 4:30 PM
MONDAY, August 20, 2020
**PROGRAM OBJECTIVES AND DESIRED OUTCOMES**

The Iowa Department of Agriculture and Land Stewardship (IDALS) is issuing this request for proposals (RFP) to provide funding for planning, development, and design of projects that lead to implementation of nutrient reduction strategy practices/concepts to reduce the loss of nutrients to waters of Iowa.

IDALS is seeking proposals for projects that complement and enhance existing efforts of the Iowa Nutrient Reduction Strategy (NRS). Projects should focus on planning and design efforts that will directly lead to the adoption of practices that provide nutrient load reductions to water resources to support the nonpoint source action items outlined in Section 1.4 (4) of the Strategy. The Iowa Nutrient Reduction Strategy can be viewed at [http://www.nutrientstrategy.iastate.edu](http://www.nutrientstrategy.iastate.edu).

Applicants should demonstrate a proven track record of delivering planning, development, and design of conservation drainage projects and practices and have established strong partnerships with stakeholders that have or will be contributing significant resources to the project. Potential projects should be structured to address short term objectives at a reasonable scale.

Desired outcomes for these projects will include concentrated efforts to develop actionable plans or planning related activities that will inform, prioritize and coordinate implementation efforts around installing conservation practices for achieving reductions in nutrient loads to surface waters. Biannual and final reports/plans will be required to document project progress and products developed. Successful projects will serve as viable options for practice funding from a variety of sources for installation after being identified, designed, etc. through the planning process. Practice funding (financial assistance) may be requested in this RFP, but applicants must justify the request based on documented demand and willingness of farmers and/or landowners in installing the practices requested during the project duration.

**PROJECT OBJECTIVES**

- Innovative and collaborative efforts to identify, plan, prioritize and/or design practices on a watershed and/or regional basis.
- Targeted to locations and/or other conditions with documented need for integration of these practices.
- Plans should prioritize conservation drainage infrastructure-based practices identified in the Iowa NRS, particularly wetlands, blind inlets, saturated buffers, denitrifying bioreactors, drainage water management, and/or oxbows. Projects may address other practices as well, but priority will be given to projects that focus on these practices and are implementable in a short timeframe during or after plans are completed.
- Projects that include and focus on practices that are cost-effective, infrastructure-based and have a larger impact on nutrient reductions will receive priority consideration for funding.
- Leverage additional resources from partner(s) entities to expand scope and impact of the project.

**PRIORITY WATERSHED AREAS**

Projects are not required to be located within priority HUC8 watersheds that have been identified by the Water Resources Coordinating Council (WRCC) but projects within these watersheds will receive priority consideration. A map is attached for reference. These HUC8 watersheds include all or parts of 68 Iowa counties and include 429 HUC12 subwatersheds. The priority HUC8 watersheds are (see map on page 8):

- Floyd
- North Raccoon
- Skunk
- East Nishnabotna
- Boone
- South Skunk
- West Nishnabotna
- Middle Cedar
- Turkey

**ELIGIBLE APPLICANTS**

Soil and Water Conservation Districts (SWCDs), counties, county conservation boards, cities or other units of government, not-for-profit non-governmental organizations (NGO’s) authorized by the secretary of state, public water supply utilities or watershed management authorities are eligible to submit proposals. Due to the nature of this program and the emphasis on actionable plans/designs and documentation supportive of the nutrient reduction strategy, applicants are strongly encouraged to collaborate with respective Regional Coordinator and/or other IDALS staff. Applicants are also strongly encouraged to partner with stakeholders that will benefit from installation of non-point, agricultural conservation practices and would be able to assist with education and information transfer.

The Primary Grantee must include documentation of their ability to provide appropriate fiscal management of the funds requested in the project proposal. If the group is unable to meet this requirement themselves, they may include...
documentation of their partnership with an entity that has an appropriate fiscal management structure in place in order to be considered an eligible applicant.

**PRACTICE FUNDING AVAILABILITY**
Significant, sustainable funding was announced during the 2018 Legislative Session for IDALS through the WQI program to advance implementation efforts of the Nutrient Reduction Strategy. This RFP does include practice funding, but applicants must explain why and show compelling reasons to request financial assistance (FA). The intent of the RFP is to look to create opportunity ahead of the availability of funding through the development of these plans to access funding as it becomes available over the next several years. Projects that develop plans with the intent and likelihood for a variety of funding sources outside of WQI (City or local government, federal, private, etc.) will be taken into consideration. Projects should be more than conceptual, having local and landowner leadership and buy-in is a critical aspect of planning and should be a part of any successful project.

**ELIGIBLE EXPENSES**
Eligible expenses include:
- Costs related to planning and project coordination
- Technical assistance costs for design and landowner outreach
- Financial assistance associated with the costs of installing NRS practices

**PROJECT DURATION**
Projects funded under this RFP will be allowed up to 3 years. Project funds will be available upon execution of a funding agreement with IDALS, and projects cannot incur reimbursable expenses before that time.

**DISBURSEMENT OF FUNDS**
The Primary Grantee will be responsible for submitting payment requests to IDALS. All payments will be made on cost-reimbursable basis. The Grantee will submit invoices and/or other required documentation to IDALS for the disbursement of funds. An explanation of the process and the required documentation will be provided to the Grantee by IDALS as part of the project agreement process.

**PROPOSAL DETAILS**
Proposals must be submitted following the format and page limits provided. Maps and letters of support will not count against stated page limits. Letters of support are required to confirm the roles/contributions of identified partners. Potential applicants are strongly encouraged to schedule a meeting with IDALS Water Quality Initiative Coordinators and/or Regional Coordinators to help formulate quality projects and proposals.

The projected timeline for the complete proposal process is detailed below:

- RFP open: July 14, 2020
- RFP closes: August 20, 2020
- Selections made: September 11, 2020
- Projected start: October 1, 2020

**PROPOSAL REVIEW & SELECTION**
Eligible proposals will be reviewed by IDALS. IDALS intends to provide notice of award described above. Upon selection, successful applicants will enter into contract negotiation with IDALS to begin on the anticipated start date.
PROPOSAL EVALUATION FACTORS (points in parentheses- 150 points possible)

- Collaborative planning, development and design activities that will lead to development of actionable plans and quickly transition to installation of practices
- Project provides good foundation for implementation, at reasonable scale, and provides opportunity for funding from a variety/combination of sources (state, federal, local government, and/or private, etc.)
- Scope and objectives are consistent with the Iowa Nutrient Reduction Strategy and this RFP
- Innovative and targeted planning of priority practices listed in RFP to areas providing most benefit
- Demonstrated strong partnerships and landowner willingness/participation levels to commit financial and in-kind support to the project
- Demonstrated ability to complete the planning project in an efficient manner; readiness to proceed quickly upon project approval
- Project is located in a priority HUC 8 watershed(s) of the Nutrient Reduction Strategy

PROPOSAL ASSISTANCE
Water Quality Initiative Coordinators – Matt Lechtenberg, 515-281-3857 or matthew.lechtenberg@iowaagriculture.gov or Matt McDonald, 515-725-1037 or matt.mcdonald@iowaagriculture.gov

For help with proposals you may obtain assistance from the Regional Coordinator for your area (map on page 8):

- Western Iowa - Bob Waters - 515-306-7012 or Bob.Waters@Iowaagriculture.gov
- Northeast Iowa - Jeff Tisl - 563-422-6201 or Jeff.Tisl@Iowaagriculture.gov
- Southeast Iowa - James Martin - 319-337-2322 ext. 4836 or James.Martin@Iowaagriculture.gov

SPECIAL NOTES
The Iowa Department of Agriculture and Land Stewardship (IDALS) prohibits discrimination in its programs on the basis of race, color, national origin, sex, religion, age, disability, political beliefs and marital or familial status. (Not all prohibited bases apply to all programs.)

Distribution of proposals is limited to people involved in the review process, but note that all proposals and subsequent reports and related information are in the public domain. All reports related to funded projects will be made available to all interested parties in printed, electronic, or other means of communication, without discrimination.

Names, addresses and telephone numbers of Project Coordinators (from funded projects) may be provided to interested news entities, potential project participants, or organizations for subsequent inquiries. Proposals are used in the peer review process and submission of a proposal establishes consent by the author for appropriate distribution to fulfill review requirements.

Proposals approved for funding will be required to enter into a project agreement with IDALS. Sponsors of approved projects will be required to submit quarterly and final project reports utilizing forms and guidance provided by IDALS.

The Iowa Department of Agriculture and Land Stewardship’s (IDALS) release of public records is governed by Iowa Code Chapter 22. Respondents are encouraged to familiarize themselves with Chapter 22 before submitting a Proposal. IDALS will copy and produce public records upon request as required to comply with Chapter 22 and will treat all information submitted by a Respondent as non-confidential records unless Respondent requests specific parts of the Proposal be treated as confidential at the time of the submission as set forth herein AND the information is confidential under Iowa or other applicable law. See following link for Form 22 – Request for Confidentiality
https://das.iowa.gov/sites/default/files/procurement/pdf/Form22-RFP.pdf
PROCEDURE FOR SUBMITTING PROPOSALS

Submit one electronic copy of your project proposal to IDALS. Arrival date and time of the electronic copy will be used to determine whether a proposal has been submitted on time. **Proposals must be received by 4:30 PM on the closing date.**

Proposals will be accepted by either of the following methods:

1. Submit the electronic copy of the proposal on some type of storage medium (CD, Flash drive, etc.) and deliver it to the address below:

   Iowa Department of Agriculture and Land Stewardship
   Division of Soil Conservation & Water Quality
   c/o Nicole Gubbels
   502 East 9th Street
   Des Moines IA 50319

2. Submit the electronic file containing your proposal in an attachment by e-mail addressed to nicole.gubbels@iowaagriculture.gov. The file size limit for submission of proposals by e-mail is 10MB in size. Hard copies of the proposal will **not** be accepted without an electronic copy. If you need assistance submitting your proposal, please contact Nicky Gubbels at 515-281-5851 or nicole.gubbels@iowaagriculture.gov.
Proposal Cover Sheet: (1 page maximum)
Provide the Following Information on a Proposal Cover Sheet. Additionally, include the signature of the lead applicant authorizing submission of the proposal.

1. Project Title:
   Applicant Entity:
   Contact Person:
   Address:
   Phone:
   E-mail:

2. Authorized signature of lead applicant______________________ Date_______

3. List the watershed, region, or focus area of the project and Project area in relationship to priority HUC8 watershed(s) (page 8):

4. Project duration, including anticipated start and completion dates:

5. Include a listing of all project partners:

6. Provide a budget summary, utilizing the format shown here:

<table>
<thead>
<tr>
<th></th>
<th>IDALS Request</th>
<th>Partner Contributions</th>
<th>Landowner Contributions</th>
<th>Total Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Proposal Narrative: (4 page maximum)
Provide brief, yet thorough, responses to the following set of questions, with the number and title for each of the sections at the top of the corresponding response.

1. Project Overview (1 page maximum)
Provide a brief overview of the proposed approach to the planning and development project proposed. Address the following questions in your response:
   - What are the critical opportunities, specific practice(s), and/or focus area(s) that will be addressed by your project?
   - How is the opportunity important in demonstration and advancement of the Iowa Nutrient Reduction Strategy?
   - What is the specific action that your project will take to address this focus or opportunity?

2. Project Objectives
List the primary objectives of the proposed project. Describe any innovative approaches and what cross-cutting actions among partners taken across objectives. Provide detail on how the project will address each objective.
How will this project be organized and managed to achieve the project’s development? How will this project lead to actionable changes? What prospective programs/options are available to fund implementation efforts? What are the specific roles of partners in achieving these objectives?

What are the anticipated goals and deliverables of the project’s activities in the timeframe allowed? Be specific on the targeted number of practices, landowners/farmers, etc.

How will this project communicate with producers and other stakeholders key to the project’s success, about its work in order to help achieve the intended change? Specify the audiences and stakeholder groups you intend to engage through the project.

**Proposal Budget:** (2 page maximum, including narrative)

Use the table format shown on the following page to provide an estimated budget for the project. You are encouraged to copy and paste this table here into your proposal. Be sure to review column and row totals for accuracy. In addition to the tables, include a narrative providing the following information:

- Explain the amount and type of all local and partner contributions that will be made to the project. This may be in the form of in-kind contributions, cash contributions, or the commitment of other program funds to be used in conjunction with the financial assistance provided by the project. There is not a matching funds requirement for this program, but it is a consideration of the reviewers. Make sure that the role for staff whose costs are included in the budget is clear in the proposal.

**Table 1. Budget Template** (excel spreadsheet version of this template is available)

<table>
<thead>
<tr>
<th>Component</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Total</th>
<th>WQI</th>
<th>Local Match</th>
<th>Match Source(s)**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical Assistance</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>Information/Education</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>Contract (list below)</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>Contract</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>Financial Assistance</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>Practice(s) (add below)</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td></td>
</tr>
</tbody>
</table>

*Provide detail on planned expenditures under Other in the budget narrative.

**Include contributions in local match. Use acronyms for other partners and identify acronyms in budget narrative.

**Technical Assistance & Info/Ed:**

- Describe the intended structure of the technical assistance funding request
- Describe how this funding supports existing technical assistance support (if applicable) and describe the need for additional funding
- Describe how info/ed support will be tailored to the project area, landowners/farmers, and corresponding with the practice(s) to be delivered. Explain the experience of the project team in delivering effective outreach to landowners and/or farmers.

**Contractual:**

- Provide detailed information on any anticipated subcontracts that will be funded through this project, including identified work products and costs associated with the subcontract.
Financial Assistance (describe compelling reason(s) to include practice funding in this request):

- Innovative practice delivery mechanism(s)?
- Documented interest/demand from landowners/farmers in the project area? Priority practice(s)? Estimated impacts of practice(s) to Iowa waterbodies?
- Leveraging of funds from outside source(s)?

Maps and Supporting Data:

Please attach any maps and other supportive data relevant to the proposal as Exhibits, labeling each Exhibit at the top of the first page.

At a minimum, the proposal must include a map of the project area for the proposal which clearly delineates region or watershed(s) to be included in the demonstration project. This map should be included as Exhibit A.

Letters of support from identified partners are required for the proposal. These letters should be included in Exhibit B. Identified partners that are providing funding (cash or in-kind) contributions must indicate these proposed contributions in their letter of support. For proposals led by Soil and Water Conservation Districts, a letter of support from the respective Area Field Office must be included with the letters of support.
Iowa Strategy to Reduce Nutrient Loss: Nitrogen Practices

This table lists practices with the largest potential impact on nitrate-N concentration reduction (except where noted). Corn yield impacts associated with each practice also are shown as some practices may be detrimental to corn production. If using a combination of practices, the reductions are not additive. Reductions are field level results that may be expected where practice is applicable and implemented.

<table>
<thead>
<tr>
<th>Practice</th>
<th>Comments</th>
<th>% Nitrate-N Reduction**</th>
<th>% Corn Yield Change**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timing</td>
<td>Moving from fall to spring pre-plant application&lt;br&gt;Spring pre-plant/sidedress 40-60 split Compared to fall-applied&lt;br&gt;Sidedress – Compared to pre-plant application&lt;br&gt;Sidedress – Soil test based compared to pre-plant</td>
<td>6 (25)&lt;br&gt;5 (28)&lt;br&gt;7 (37)&lt;br&gt;4 (20)</td>
<td>4 (16)&lt;br&gt;10 (7)&lt;br&gt;0 (3)&lt;br&gt;13 (22)*&lt;br&gt;</td>
</tr>
<tr>
<td>Source</td>
<td>Liquid swine manure compared to spring-applied fertilizer&lt;br&gt;Poultry manure compared to spring-applied fertilizer</td>
<td>4 (11)&lt;br&gt;-3 (20)</td>
<td>0 (13)&lt;br&gt;-2 (14)&lt;br&gt;</td>
</tr>
<tr>
<td>Nitrogen Management*</td>
<td>Nitrogen rate at the MRTN (0.10 N:corn price ratio) compared to current estimated application rate.&lt;br&gt;(ISU Corn Nitrogen Rate Calculator – <a href="http://cerc.agron.iastate.edu">http://cerc.agron.iastate.edu</a> can be used to estimate MRTN but this would change Nitrate-N concentration reduction)</td>
<td>10</td>
<td>-1&lt;br&gt;</td>
</tr>
<tr>
<td>Nitrification Inhibitor</td>
<td>Nitrapyrin in fall – Compared to fall-applied without Nitrapyrin</td>
<td>9 (19)</td>
<td>6 (22)&lt;br&gt;</td>
</tr>
<tr>
<td>Cover Crops</td>
<td>Rye&lt;br&gt;Oat</td>
<td>31 (29)&lt;br&gt;28 (2)</td>
<td>-6 (7)&lt;br&gt;-5 (1)&lt;br&gt;</td>
</tr>
<tr>
<td>Living Mulches</td>
<td>e.g. Kura clover – Nitrate-N reduction from one site</td>
<td>41 (18)</td>
<td>-9 (32)&lt;br&gt;</td>
</tr>
<tr>
<td>Land Use</td>
<td>Energy Crops – Compared to spring-applied fertilizer&lt;br&gt;Land Retirement (CRP) – Compared to spring-applied fertilizer&lt;br&gt;Extended Rotations – At least 2 years of alfalfa in a 4 or 5 year rotation&lt;br&gt;Grazed Pastures</td>
<td>72 (23)&lt;br&gt;85 (9)&lt;br&gt;42 (12)&lt;br&gt;85</td>
<td>7 (7)&lt;br&gt;</td>
</tr>
<tr>
<td>Edge-of-Field</td>
<td>Drainage Water Mgmt.&lt;br&gt;Shallow Drainage&lt;br&gt;Wetlands&lt;br&gt;Bioreactors&lt;br&gt;Buffers&lt;br&gt;Saturated Buffers&lt;br&gt;Multi-purpose Oxbow</td>
<td>No impact on concentration&lt;br&gt;No impact on concentration&lt;br&gt;Targeted water quality&lt;br&gt;43 (21)&lt;br&gt;Only for water that interacts with the active zone below the buffer. This would only be a fraction of all water that makes it to a stream.&lt;br&gt;Divert fraction of tile drainage into riparian buffer to remove Nitrate-N by denitrification.&lt;br&gt;Targeted water quality</td>
<td>33 (32)&lt;br&gt;32 (15)&lt;br&gt;52&lt;br&gt;91 (20)&lt;br&gt;50 (13)&lt;br&gt;42 (6)&lt;br&gt;</td>
</tr>
</tbody>
</table>

* A positive number is nitrate concentration or load reduction and a negative number is an increase.

** A positive corn yield change is increased yield and a negative number is decreased yield. Practices are not expected to affect soybean yield.

† SD = standard deviation. Large SD relative to the average indicates highly variable results.

* This increase in crop yield should be viewed with caution as the sidedress treatment from one of the main studies had 95 pounds-N/acre for the pre-plant treatment but 110 pounds-N/acre to 200 pounds-N/acre for the sidedress with soil test treatment so the corn yield impact may be due to nitrogen application rate differences.
Iowa Strategy to Reduce Nutrient Loss: Phosphorus Practices

Practices below have the largest potential impact on phosphorus load reduction. Corn yield impacts associated with each practice also are shown, since some practices may increase or decrease corn production. If using a combination of practices, the reductions are not additive. Reductions are field level results that may be expected where practice is applicable and implemented.

<table>
<thead>
<tr>
<th>Practice</th>
<th>Comments</th>
<th>% P Load Reduction(^a)</th>
<th>% Corn Yield Change(^b)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Average (SD(^d))</td>
<td>Average (SD(^d))</td>
</tr>
<tr>
<td>Phosphorus Application</td>
<td>Applying P based on crop removal – Assuming optimal STP level and P incorporation</td>
<td>0.6(^d)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Soil-Test P – No P applied until STP drops to optimum or, when manure is applied, to levels indicated by the P Index(^e)</td>
<td>17(^e)</td>
<td>0</td>
</tr>
<tr>
<td>Source of Phosphorus</td>
<td>Liquid swine, dairy, and poultry manure compared to commercial fertilizer – Runoff shortly after application(^f)</td>
<td>46 (45)</td>
<td>-1 (13)</td>
</tr>
<tr>
<td></td>
<td>Beef manure compared to commercial fertilizer – Runoff shortly after application(^f)</td>
<td>46 (96)</td>
<td>0</td>
</tr>
<tr>
<td>Placement of Phosphorus</td>
<td>Broadcast incorporated within 1 week compared to no incorporation, same tillage</td>
<td>36 (27)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>With seed or knifed bands compared to surface application, no incorporation</td>
<td>24 (46)</td>
<td>0</td>
</tr>
<tr>
<td>Cover Crops</td>
<td>Winter rye</td>
<td>29 (37)</td>
<td>-6 (7)</td>
</tr>
<tr>
<td>Tillage</td>
<td>Conservation till – chisel plowing compared to moldboard plowing</td>
<td>33 (49)</td>
<td>0 (6)</td>
</tr>
<tr>
<td></td>
<td>No till compared to chisel plowing</td>
<td>90 (17)</td>
<td>-6 (8)</td>
</tr>
<tr>
<td>Perennial Vegetation</td>
<td>Energy Crops</td>
<td>34 (34)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Land Retirement (CRP)</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Grazed pastures</td>
<td>59 (42)</td>
<td></td>
</tr>
<tr>
<td>Terraces</td>
<td></td>
<td>77 (19)</td>
<td></td>
</tr>
<tr>
<td>Buffers</td>
<td></td>
<td>58 (32)</td>
<td></td>
</tr>
<tr>
<td>Erosion Control and Edge-of-Field</td>
<td>Sedimentation basins or ponds</td>
<td>85</td>
<td></td>
</tr>
<tr>
<td>Blind Inlet</td>
<td>Sediment control</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

\(^a\) A positive number is P load reduction and a negative number is increased P load.
\(^b\) A positive corn yield change is increased yield and a negative number is decreased yield. Practices are not expected to affect soybean yield.
\(^d\) SD – standard deviation. Large SD relative to the average indicates highly variable results.
\(^e\) Maximum and average estimated by comparing application of 200 and 125 kilogram P\(_2\)O\(_5\)/hectare, respectively, to 58 kilogram P\(_2\)O\(_5\)/hectare (corn-soybean rotation requirements) (Mallarino et al., 2002).
\(^f\) Maximum and average estimates based on reducing the average STP (Bray-1) of the two highest counties in Iowa and the statewide average STP (Mallarino et al., 2011a), respectively, to an optimum level of 20 ppm (Mallarino et al., 2002). Minimum value assumes soil is at the optimum level.
\(^g\) ISU Extension and Outreach publication (PM 1688).
\(^h\) See Standard Practices (blue box) on page 2 of this publication.