

Agriculture Water Quality Partnership Forum

10/20/2020 10:00 – 11:30 am

In attendance: Kristi Jones, IDOA; Brian Rennecker, IDOA; Trevor Sample, Illinois EPA; Reid Christianson, University of Illinois; Mark Schleusener, USDA – NASS; Jean Payne, IL Fertilizer & Chemical Association; Jason Solberg, IFCA; Anna Marshall, University of Illinois; Eliana Brown, Illinois Extension/IISG; Kate Gardiner, Illinois Extension/IISG; Julie Armstrong, Illinois NREC; Megan Baskerville, TNC; Michelle Bloomquist, IDNR; Dennis Bowman, Illinois Extension; Emily Bruner, American Farmland Trust and S.T.A.R.; Laura Christianson, University of Illinois/Illinois Extension; Albert Cox, Metropolitan Water Reclamation District of Greater Chicago; Ivan Dozier, NRCS; Albert Ettinger, Sierra Club/Mississippi River Collaborative; Mary Beth Falsey, DuPage County Stormwater; Liz Hobart, GROWMARK; Jennifer Jones, Illinois Extension; Marie Lemke, TNC; Lauren Lurkins, Illinois Farm Bureau; Mila Marshall, Sierra Club of Illinois; Raelynn Parmely, Illinois Farm Bureau; Justin Ramey, IDNR; and Amy Roady, Illinois Soybean Association

Meeting Summary

Welcome and Introductions

Eliana Brown welcomed everyone and turned it over to Kristi Jones, who led the meeting.

Additional Implementation Scenario Development - Reid Christianson, University of Illinois

Dr. Reid Christianson introduced the implementation scenarios he has been working on with Illinois EPA. There are six core scenarios and three extended scenarios. Interim goals are met by scenarios N7, P7, and NP7; full goals are met by scenarios N8, P8, and NP8; and other ideas are included in extended scenarios EXT1, EXT2, and EXT3. Reid encouraged AWQPF members to share their feedback on the scenario development.

NASS Survey Report - Mark Schleusener, USDA-NASS

State Statistician Mark Schleusener shared the results of the NLRS Survey conducted by NASS. The survey reference year is 2019 and funding is provided by Illinois NREC. Results are shown in the NASS Survey Report PowerPoint presentation.

4R Metric Survey Report - Jean Payne and Jason Solberg, IFCA

Jean Payne and Jason Solberg presented on the results and preliminary trends of their 4R Metric survey. IFCA surveys the ag retailers following each fall and spring fertilizer season, asking them to report nutrient practices on the acres on which the custom apply nutrients, consistent with the 4R Code of Practices which also includes many of the INLRS suggested activities.

They have data for fall 2018, spring and fall 2019, and spring 2020 and have grown the number of reported acres substantially since starting this effort. Jean and Jason welcomed feedback on the questions we pose to our members and how we can best utilize this survey to provide progress reports on voluntary nutrient management practices going forward.

Reporting Spreadsheet - Anna Marshall, University of Illinois

Dr. Anna Marshall presented on the updates made to the Illinois NLRS reporting spreadsheet (also known as the Resources and Outreach spreadsheet) and initiated a focus group to make further

improvements. If you have any questions, you can reach out to Dr. Anna Marshall at amarshll@illinois.edu.

Next Steps

The NLRs Partnership Workshop is Friday, November 6th. Register at go.illinois.edu/nlrs.

Provide feedback on implementation scenarios to IllinoisNLRs@gmail.com by end of business on Friday.

Meeting Minutes

Welcome and Introductions

Eliana Brown and Illinois Department of Agriculture Deputy Director Kristi Jones welcomed everyone to the meeting.

Additional Implementation Scenario Development - Reid Christianson, University of Illinois

Dr. Reid Christianson from the University of Illinois Department of Crop Sciences has developed additional implementation scenarios for meeting the Illinois NLRs goals.

For some background, the scenarios are needed to reflect interim goals, which are a 15% reduction in nitrate loss and a 25% reduction in total phosphorus loss. He aligned the scenarios with available data sources, included point source reductions, and used the practice efficiencies identified in the David et al (2014) science assessment. The 2011 benchmark period is used as a starting point, so additional acres needed are from 2011. He also incorporated “practical maximum” values to limit over-use of best management practices (BMPs). Information sources vary, as bioreactor and wetland maximum was suggested by David et al. (2014), nitrogen management (i.e. MRTN) is set at all corn acres, and cover crops are after Kladviko (2014). The nitrogen management practices are specific. For example, moving from fall-applied N to spring-applied N. Before getting into the scenarios, Reid emphasized that he is looking for input from the AQWPF members. The scenarios are drafts and he needs input on practice feasibility (reality), whether the number of acres suggested is appropriate, and if additional scenarios may be needed.

For a quick overview, there are six core scenarios and three extended scenarios. He used the naming convention from the original strategy, with letters N and P signifying nitrogen and phosphorus and numbers 7 and 8 signifying interim and full reduction goals, respectively. Interim goals are met by scenarios N7, P7, and NP7. Full goals are met by scenarios N8, P8, and NP8. The dollar amount is in billions. There are tables for each scenario, which Reid will walk through.

Each scenario includes a summary table and a practice-specific table. Scenario summary tables include N or P reduction (lbs), statewide N or P reduction (%), area impacted (acres), net equal annualized cost (EAC) (per acre), total net EAC (to the nearest \$1 million), EAC Savings (to the nearest \$1 million), and the number of practices involved.

The practice-specific table includes practice N or P efficiency (% reduction), treated area needed (acres), benchmark (~2011) treated area (acres), increased treated area needed (acres), adoption needed (%), maximum implementation (acres), statewide N or P reduction (%), statewide agricultural N or P reduction (%), and tracking sources. There are three columns with cost – far right is cost savings, middle is actual costs, and then net equal annualized cost is the total cost minus the cost savings. Reid thought

it important to break these down for transparency purposes. Both tile-drained and non-tile drained acres contribute N to the system. For the specific practices associated with this scenario, the column on the left names the scenarios and then horizontal headers for the metrics. "Treated Area Needed" shows how many acres of that practice needed to meet the reduction goal. "Benchmark" is showing how many acres on the ground in 2011. "Increased Treated Area Needed" shows how many more acres are needed (from 2011). "Maximum Implementation Acres" is the ceiling, acres can't go any higher than that value. "Tracking Sources" highlight the data source to track those practices. The NLRs NASS Survey is frequently cited as the tracking source - it's a great source of information.

Scenario N7 meets the interim goal of 15% nitrate loss reduction statewide. To meet the 15% N loss reduction goal, a statewide agricultural N loss reduction of 16% was needed to make up for a lack of measure for stormwater. Reid would like to hear thoughts on that. Bioreactors have 100% implementation. There are many acres in 2011 following MRTN, we don't have a lot of room to grow there. This scenario has an agriculture EAC of \$257 million with an EAC savings of \$19 million.

Scenario P7 meets the interim goal of 25% P loss reduction. This scenario has an agriculture EAC of \$206 million and EAC savings of \$94 million.

Scenario NP7 meets the interim goals for both N and P loss reductions. This scenario has an agriculture EAC of \$257 million and EAC savings of \$114 million.

Scenario N8 meets the full 45% Nitrate loss reduction goal. This scenario has an agriculture EAC of \$1.48 billion and EAC savings of \$19 million.

Scenario P8 meets the full 45% Phosphorus loss reduction. This scenario has an agriculture EAC of \$1.76 billion and EAC savings of \$100 million. We are pushing here on the buffers as a gap-filling practice. We don't have a great source of data for buffers. If anyone has thoughts on data sources for buffers, please reach out to Reid.

Scenario NP8 meets both the N and P 45% loss reduction goals. This scenario has an agriculture EAC of \$1.87 billion and EAC savings of \$114 million. This is the all-in scenario, where everything meets the goals. This has 100% implementation of almost all practices. Bioreactors and wetlands were reduced a little bit for an economic benefit.

Extended scenarios include EXT1, EXT2, and EXT3. EXT1 shows detailed tillage categories. There is the potential to increase phosphorus loss reduction estimates. Distribute 6.3 million acres of conservation tillage from P8. If evenly distributed over reduced till, mulch till, and no-till, this would increase phosphorus loss reduction by 0.6%. If all are moved to no-till, this would increase phosphorus loss reduction by 2.9%. The Illinois Department of Agriculture's Tillage Transect Survey provides estimates of erosion to gauge effectiveness.

Scenario EXT2 is for saturated buffers. We don't have saturated buffers in our strategy, but if we're looking at implementing that at maximum level, we can take a 4.6% statewide N reduction.

Scenario EXT3 looks at conversion to perennial. We would need 14.4 million acres to meet that 45% P loss goal. All scenario tables follow for comparison.

Discussion

Albert Ettinger: Are you looking at livestock at all? This all assumes continued percentages of acreage in corn and beans?

Reid Christianson: This is looking at the status quo for ag. If 2020 has taught us anything, it's that things can change, so who knows.

Laura Christianson: Can you explain the savings? Who saves?

Reid Christianson: The individual farmer would save if they are reducing application rates. These are coarse numbers in terms of costs. If you are reducing your application rate, you'd be saving on purchasing fertilizer. Allocation of cost is hard to build into the scenarios, so keeping costs and savings separate highlights potential disconnects between the scenario and overall cost. I think this adds a level of transparency.

Amy Roady: Are there any other practices that were considered but not included?

Reid Christianson: Land use change was a big one. I didn't include that in the six scenarios, just in an extended one. The way we do business could change overnight, but the trend hasn't been that way, so a change that large in land use could be not realistic. An example would be the specific tillage practices rather than the conservation tillage bin.

Lauren Lurkins: How does our work on scenarios stack up to other states?

Reid Christianson: That's a good question and right now I don't have a definite answer. Iowa has been pretty proactive with their scenario development, but I don't know how our scenarios stack up.

AWQPF Member: Do costs just include the actual implementation costs of each practice? What might costs look like for the increased on the ground staff capacity needed to implement the strategies?

Reid Christianson: That's a great question. When I was at Iowa State University helping with their nutrient strategy, we made an explicit disclaimer about our costs. Just a note, these scenarios are not prescriptive in any way. When we look at putting together the biennial report, we can have a bar graph showing "here's what we might have needed to meet this particular scenario and here's what we have now." It's to show how we're progressing towards one hypothetical.

Kristi Jones: Thank you, Reid, for your presentation.

NASS Survey Report - *Mark Schleusener, USDA-NASS*

Mark Schleusener has worked at NASS for thirty years, including 29 years as an analyst and supervisor of analysts. He has served as State Statistician since November 2013 and contributed to communication and outreach and college recruiting. NASS provides timely, accurate, and useful statistics in service to U.S. agriculture.

The survey reference year is 2019. For sampling, we wanted cropland in between 100 and 5,000 acres and got 1,097 total farms in the sample. There were two mailings, in January 2020 with a follow-up in February for those who had not yet responded. We also called non-respondents in mid-April. All the funding was provided by NREC. For margins of error, for common items like cropland or tilled acres, one

standard error is less than 10%. For less common items like cover crops, one standard error is 20% or more. Some items, like bioreactors, are very rare and the margins of error are very large. The response rate has gotten better this year.

The Nitrogen Management Strategy asks about NASS corn planted acres and compares acres in 2017 to those in 2019. Acres where an MRTN strategy was used to determine application rates was 33% in 2017 and increased to 35% in 2019. Other industry-approved techniques were used on 69% of planted acres in 2017 and up to 70% in 2019. Fertilizer application strategies for corn on tilled acres: Farmers are doing a fair amount more spring applications now than in the past. We also look at non-tilled acres with the same questions.

These next questions are regarding fertilizer application strategies for corn on tilled acres. Fall/winter nitrogen was applied with a nitrification inhibitor on 32% of acres in 2017 and 14% in 2019. Spring nitrogen was applied with a nitrification inhibitor on 25% of acres in 2017 and 21% of acres in 2019. For fertilizer application strategies on non-tilled acres, fall/winter nitrogen was applied with a nitrification inhibitor on 9% of acres in 2017 and 5% of acres in 2019. Spring nitrogen was applied with a nitrification inhibitor on 9% of acres in 2017 and 20% of acres in 2019.

Mark noted that the following questions compare to the specific goals of the NLRs. Strategy 1 is fall/winter N was 50% or less of total N. This applied to 7% of acres in 2017 and 3% in 2019. Strategy 2 is fall/winter N was 0% of total N (all spring applications). This applied to 17% of acres in 2017 and 16% in 2019. Strategy 3 is less than 50% fall/winter applications, with remaining nitrogen applications split between pre-plant and side-dress applications. This applied to 16% of acres in 2017 and 18% of acres in 2019. There may be some limitations in how these questions are worded. In Strategy 1, if a farmer applied 51% of their N in fall or winter, then it doesn't count. Like in college, you don't get partial credit for a question – it's either right or wrong. Mark wondered if there's a way to establish ranges that could fit into a range of categories, saying it could help give statistics that are perhaps more meaningful.

Since 2011, farmers have reduced phosphorus applications on more than 7 million total acres. Mark thinks this may be due to variable rate applications and soil testing. Between 2017 and 2019, Illinois more than doubled soil testing acres. For cover crops, there was an increase as well. Illinois had about 1.5 million prevent plant acres last year.

The general knowledge questions show that about 55% of people are slightly or not at all knowledgeable about the Illinois NLRs. People are more familiar with cover crop management.

Discussion

Julie Armstrong: Just to add some information, Mark and I have talked quite extensively about this question and Trevor and I have talked as well. As we go forward, we may need to rethink this question. Originally, when the survey was put together, we wanted it to line up exactly with the way that the strategy was written, which is great for us, but can be hard for farmers who don't have the strategy memorized. So we may need to clarify this question.

Mark Schleusener: Thank you, Julie, I think that's well said. We may need to reboot with our question design.

4R Metric Survey Report - Jean Payne and Jason Solberg, IFCA

Jean Payne and Jason Solberg presented on the results and preliminary trends of their 4R Metric survey.

IFCA surveys the ag retailers following each fall and spring fertilizer season, asking them to report nutrient practices on the acres on which they custom apply nutrients, consistent with the 4R Code of Practices, which also includes many of the NLRS suggested activities.

To date, IFCA has conducted four surveys, beginning in the fall 2018 fertilizer season. This report shows a comparison of the results received from two consecutive fall fertilizer seasons (fall 2018 and 2019) and two consecutive spring seasons (spring 2019 and 2020). IFCA uses SurveyMonkey and sent the survey to 650 retail members. Retailers can only answer to what they know was custom applied. They cannot account for all applications made on their customers' fields. They have grown the number of reported acres substantially since starting this effort. Jean and Jason welcomed feedback on the questions we pose to our members and how we can best utilize this survey to provide progress reports on voluntary nutrient management practices going forward.

Surveys are anonymous and are sent out after everything gets completed. Now that they have multiple years' worth of data, they can do some comparisons. Jason went through some results they have gathered. IFCA purposefully keeps the survey at about ten questions because people are taking time out of their busy schedules to complete it.

Starting with the fall results, they always ask for total acres. In 2019, they got over 14 million representative acres. They ask if retailers sell anhydrous ammonia and if they do, what percent of acres received it? The big difference in question three is because in fall 2018, there was a very narrow window to apply and in 2019, there was more opportunity to apply. Every year, Emerson Nafziger puts out a bulletin with a date saying it's safe to put on anhydrous ammonia. In 2018, 89% of acres were treated after that date and in 2019, 85% of acres were. Ideally, responses to question five to be 100% on nitrification inhibitors, but if they had asked that question in 2008 or 2009, the response would be about 50%, so there's been improvement. There was a drop off in questions six, seven, and nine.

The spring survey is only seven questions. The surveys in fall 2019 and spring 2020 have received significantly more responses, so that's promising. The second question can be confusing because the MRTN and Nitrogen Rate Calculator are essentially the same thing. To clarify, IFCA provided the rate that is the MRTN and Jean and Jason wondered if they would be better off telling survey responders what the recommended rate is? If it's falling within that range, that's what the NLRS is about – picking something within that range. So they have been trying to get more specific. Question four was about what percentage of acres received spring applied P.

Jean and Jason requested to let them know if there are any additional questions or information that they should be asking. However, they don't want to add so many questions that it would deter people from filling it out. Jason added that he would like to keep the questions as they are for one more year to see a comparison across three years.

Discussion

General AWQPF Responses:

Great point, Jean.

Agree on that point Jean. I think using the range would give us a better insight

In the NASS survey we ask about awareness of MRTN so we can still measure that aspect

Yes, I like the approach of using specific ranges of N / acre.

Mila Marshall: I am interested in understanding if those that answered the fall survey are the same people who filled out the spring

Jean Payne: Mila, I would surmise to say the answer is yes to that, the same folks at ag retail are responding. Usually the person in charge of agronomy at the facility. Also, we don't fall apply nitrogen in southern Illinois.

Mila Marshall: Thank you for clarifying that. What I was trying to ask is whether you can tie Retailer A fall responses to Retailer A spring responses. Can we connect retailers to their responses to see if there's a potential connection?

Mark Schleusener: Do you have a good feel for your "coverage" in northern vs central vs southern Illinois?

Jean Payne: Yes, the one thing we did is provided a map from the nitrogen rate calculator. So they could identify which county they are in. So we could ask what region they are reporting from.

Lauren Lurkins: I am wondering if we could add something on cover crops. I am aware of many ag retailers who help farmers make those management decisions, and perhaps that would be great to add here to watch that continue to grow.

Jean Payne: Yes, after two full crop years, we are interested in seeing other aspects. Even if they're not involved in planting the cover crops, they would be knowledgeable about them from helping terminate.

Mila Marshall: Thanks! So valuable to know.

Lauren Lurkins: Thanks!

Eliana Brown: Thank you, Jean and Jason!

Mila K. Marshall: This was great!

Megan Baskerville: Thanks, Jean and Jason. Lots of insight!

Reporting Spreadsheet - Anna Marshall, University of Illinois

Dr. Anna Marshall presented on the updates made to the Illinois NLRs reporting spreadsheet (also known as the Resources and Outreach spreadsheet).

Updates include the addition of the Funded Programs category in the Staff and Financial tab and the addition of the Funded Research and Publications/Outreach Tools categories to the Outreach tab. Virtual events should be entered under their respective categories in normal years (i.e. Virtual field days would be entered under "Field Days," a webinar would be entered under "Presentations," etc.). If an activity is not covered in one of the existing categories, please add it to "Additional Activities" at the end of the Outreach tab.

The spreadsheet should be returned to Kate Gardiner at kgardin2@illinois.edu or IllinoisNLRs@gmail.com. If you have any questions, don't hesitate to reach out to Dr. Anna Marshall at amarshll@illinois.edu. Anna encouraged AWQPF members interested in improving the spreadsheet to join her for a focus group.

Discussion

Lauren Lurkins: How would you fill out the survey question? We ask nutrient questions on surveys. How would you best use the space to give you that information?

Anna Marshall: Do you survey individual members or organizations?

Lauren Lurkins: We have about 80,000 members and we survey them ahead of our annual meeting.

Anna Marshall: There is a category in the outreach survey for surveys. I know your reporting is so excellent that you often include attachments, so if you can identify the survey in that spreadsheet section or wanted to include attachments for responses, we'd welcome that.

Lauren Lurkins: Raelynn is a social scientist too, so she takes this seriously. Maybe you could help us understand how the scenarios connect with what we've heard today. Is it just for the purposes for the report? I think we know that we have a lot of stuff going on, but it can be hard to connect it all in a way that makes sense. I feel like I know how it's supposed to work out, but we're always learning, and I look to leadership to understand how it all connects.

Anna Marshall: I think you're raising interesting questions. One of the things we're measuring is activity and what impact it is having. And Reid is telling us what impact it's having on actual reductions and the survey responses are telling us whether the message is getting through to producers. It's a puzzle trying to match it together. If an organization does a survey related to the strategy, rather than reporting "yes, we did a survey," we would love to see the questions and responses.

Lauren Lurkins: That helps, thank you.

Albert Cox: Hi Anna, I know that this is the ag group and I am point source, but the point sources do the reporting of financial and outreach activities as well. I will provide information to be part of the focus group so that we can align our reporting with what you expect.

Anna Marshall: This is the first time we're considering different reporting instruments for Agriculture. We would love to hear your perspective.

Kate Gardiner: Thanks, Anna!

Dennis Bowman: Thanks!

Next steps

The NLRS Partnership Workshop is Friday, November 6th. Register at go.illinois.edu/nlrs.

Provide feedback on implementation scenarios to IllinoisNLRS@gmail.com by end of business on Friday.