

Minutes of the
SERA-IEG 17 Annual Meeting
Minimizing Agricultural Phosphorus Losses for Protection of the Water Resource
July 27-29, 2000

The 2000 meeting of SERA-IEG 17 was held in Madison, Wisconsin. Hosting the meeting were Larry Bundy and Leslie Cooperband from the University of Wisconsin-Madison, and Mark Powell from the USDA-ARS, Dairy Forage Research Center. Brad Joern from Purdue University chaired the sessions.

The meeting was called to order at 8:00 am on July 27, 2000. Mark Powell welcomed participants and introduced Mr. Ben Brancel, Secretary of the Wisconsin Department of Agriculture. Mr. Brancel welcomed participants to Wisconsin and indicated there was a strong need for research to answer questions related to P contamination of water resources. Following Mr. Brancel, Dr. Elton Eberle, Dean of the College of Agricultural and Life Sciences, welcomed participants to Madison and encouraged close communication between researchers, outreach personnel, producers, and policy makers. After these remarks, the group left on a field trip to visit two dairy farms and a cold water creek restoration project.

On July 28, 2000, Brad Joern called the meeting to order at 8:00 am. and introduced Dr. Michael Ouart, administrative advisor to SERA-IEG 17. Dr. Ouart indicated that SERA-IEG 17 has been one of the most productive and successful IEG groups. He also indicated that the group should encourage the participation of more animal scientists. Following Dr. Ouart's remarks, the following presentations were made. Highlighted remarks or comments that require action by SERA-IEG 17 members are listed below each presentation.

Nutrient Criteria: Rational Development and How SERA 17 Can Participate.

George Gibson, USEPA, Washington, DC

USEPA has established Regional Technical Assessment Groups (RTAGs) which will provide input on nutrient criteria for 10 ecoregions. Participation by SERA-IEG 17 members in RTAGs is strongly encouraged.

AFO/CAFO Update and TMDL Progress Report

Roberta Parry and Jan Goodwin, USEPA, Washington, DC.

The 1998 National Water Quality Inventory concluded that 35% of rivers and 45% of lakes and reservoirs are polluted and that agriculture is the leading source of pollution. Comments by SERA-IEG 17 are encouraged for the Agricultural Management Measures Proposal, which will be released this summer, and for the CAFO Proposal, which will be released December 15, 2000.

Update on Developing and Implementing CNMPs

Jerry Lemunyon, NRCS, Fort Worth, TX

Colorado and Virginia received \$75,000 for runoff simulation studies. About \$300,000 are expected to be available to support similar work in FY 2001.

Nutrient Management News from Across the Pond

Bob Foy, Dept. of Agriculture and Rural Development, Northern Ireland

Northern Ireland initiated a voluntary Responsible P Management program. Currently, in Europe there is no P legislation similar to the Nitrate Directive.

Targeting Technologies and Education for Improved P Management

Robin Shepard, University of Wisconsin

Taking the P Out of Poultry: Impact of HAP corn and Phytase on Manure P.

Tom Sims, University of Delaware

The use of HAP corn and phytase may allow a 20% reduction in broiler litter P content. More research is needed on P sorption when phytase is added to the diet.

Taking the P out of Pigs: Impact of HAP corn and phytase on Manure P.

Brad Joern, Purdue University

The use of HAP corn and phytase may allow a 40% reduction in P excretion and a 50% increase in P uptake. More research is needed on sorption of P by soil when HAP corn and phytase are used.

Interaction between Manure Type and Soil P History: Effects of water-soluble P

Laura Ward-Good, University of Wisconsin

There was a difference in water-soluble P between high-P and low-P soils when dairy manure was applied but not when poultry litter was applied. More work is needed to understand these differences.

Can FeCl₃, AlCl₃, and Polymers Improve Manure P Recovery/Management?

Tommy Daniel, University of Arkansas

AlCl₃ and polymers can be used to remove P from dairy slurry, but engineering aspects still need to be worked out.

Struvite: It is not Just for Clogging AFO Plumbing Anymore

Rob Mikkelsen, North Carolina State University

Addition of Mg and pH manipulation of swine effluent can be used to precipitate struvite, a mineral containing P.

Management Effects on P Runoff from Cropland

Larry Bundy, University of Wisconsin

Management practices affected total P losses in runoff from plots receiving dairy slurry, but did not affect DRP in runoff. More work is planned.

BMP's: Will they Reduce Agricultural P Loss to Surface Waters?

Neil Hansen, University of Minnesota

Runoff water can move into a field through the drainage network and bring P with it.

P losses from Grassland after Applying Fertilizer and Dairy Slurry

Neil Preedy, IGER, UK

Losses of P from grasslands can be larger with triple superphosphate than with dairy slurry. An International P Transfer Workshop (IPTW-2001) will be held 28 Aug-8 Sept. 2001 in Plymouth, Devon, England. Those interested in issues relating to scaling P losses from small plots to fields and watersheds are encouraged to participate.

Data vs BPJ: Quantifying P Index Values for Arkansas Pastures

Philip A Moore, Jr., USDA-ARS, Fayetteville, AR.

Soluble P applied is the dominant factor controlling P in runoff from pastures receiving poultry litter.

Field-scale Analyses of P Loss to Surface Waters

Wes Jarrell, Consultant

There is a need to consider the land-water continuum when determining nutrient criteria for waters.

Running P Off the Land: from Centimeters to Kilometers

Ralph Wright, Alberta, Canada

There may be differences in runoff P concentrations between laboratory rainfall simulations, field rainfall simulations, and small watershed studies.

Water Quality in Lake Mendota: Response to P Loading

Dick Lathrop, Wisconsin DNR and University of Wisconsin Center for Limnology

The water residence time in Lake Mendota is 4.5 years, whereas the P residence time is 1.3 years. A concentration of 0.03 mg P/L is the threshold for eutrophic conditions in the lake.

On July 29, the meeting started at 9:00 am and covered issues related to the P Index developed or under current development by different states.

Living with the Phosphorus Index: A Real Life Story

Frank Coale, University of Maryland

Delaware is using a threshold of 3 x Critical level ($3 \times 50 \text{ lb P/A} = 150 \text{ lb P/A}$) to determine which fields need to be assessed with the P Index. Those fields below 150 lb P/A do not need to be assessed. Operations that use commercial fertilizer need to have an N&P-based plan by December 31, 2001. Operations that use manures need to have an N-based plan by December 31, 2001, and an N&P-based plan by July 1, 2004.

Soil Specific PI's

Steve Hodges, North Carolina State University.

North Carolina is calling its P Index P Loss Assessment (PLA) to avoid confusion with the soil test P, which is also called a P Index. North Carolina is developing specific PLA's to take into consideration 3 physiographic regions, 8 soil orders, 485+ soil series, and 52 soil management groups.

P Index Open Discussions

Antonio Mallarino (Iowa)

Iowa is scheduled to have its first version of the P Index by October 2000 and the final version by April 2001. Their P Index can have a maximum value of 23, which refers to a loss of 23 lb P/A year

Sam Feagley (Texas)

Texas has finished its P-Index after 3.5 years of work.

John Lory (Missouri)

Two indices are proposed for Missouri, one that will assess relatively slow P losses (Slow-leak Index), and one that will assess P losses through catastrophic events (Catastrophic Index). The Slow-leak Index considers soil test P (A), erosion (B), and runoff volume (C). The Catastrophic Index considers placement (A), runoff volume (B), and probability of runoff (C). Both indices are computed as $A \times B \times C$.

Doug Beegle (Pennsylvania)

The P-Index developed in Pennsylvania is similar to that of Maryland, Delaware, and Vermont. It has a leaching component, but that is not a major transport mechanism. Further work is still needed.

Don Graetz (Florida)

There is concern about P leaching in deep sands with karst topography in central Florida. The group is still working on defining Pleaching potential.

Larry Bundy (Wisconsin)

A field evaluation showed a relatively poor relationship between the P-Index and the loss of P in runoff simulation studies. Further work is needed.

Bob Stevenson (Washington)

P Index is seen as a teaching tool. There is one version for eastern Washington and one version for western Washington. Bob Stevenson and Dan Sullivan have an M.S. position open to work on the P Index for Washington and Oregon.

April Leytem (Delaware)

The P index for Delaware is similar to that of Maryland. Delaware intends to use the P Index in all fields (as opposed to Maryland, which is using the P Index in fields with STP > 150 lb P/A).

Bill Jokela (Vermont)

Vermont is planning to use a preliminary assessment to identify fields in which the P Index needs to be computed. The preliminary assessment uses runoff, land erodibility, flooding frequency, and soil test P. If any of these variables is in the high category, then the P Index needs to be computed.

To Normalized or Not to Normalize ... That is the Question

Chuck Landers, NRCS, and Roberta Parry, USEPA

NRCS and USEPA believe that P Index values need to be normalized so that they can be compared across states. Posting of the different P Indices on a web site is encouraged to facilitate communication. In October 2000 there will be an EPA meeting in Mobile, Alabama, in which the P Index will be discussed. Wes Wood was nominated to attend the meeting representing SERA-IEG 17.

Tom Sims expressed the need to define soil test P levels beyond which no further applications of P should be made in order to conserve P as a natural resource. Roberta Parry expressed agreement and commented that this is EPA's position on the subject.

Soil Sampling: And the Survey Says!

Peter Kleinman, USDA-ARS, State College, PA.

A recommendation was made to take 10 cores from each runoff simulation site and to analyze each core separately. The holes left should be filled with cores taken from around the microplots. Because the two microplots used for simultaneous collection of runoff are really pseudo replications, a recommendation was made to average results from the two plots when developing the regression between runoff P concentration and soil test P. To obtain a relationship between runoff P and soil test P, it is recommended to simulate runoff in 5 to 10 sites, a site being two microplots. Tommy Daniel has found a deionizing filter that can be used to clean the water used for runoff simulations. Because the cost is only \$40 per month, the group agreed that use of this filter is justifiable. Caution should be taken when screwing nozzles in place because their orientation and placement can affect the spray pattern of the rainfall simulator.

Insurance of BMP and IPM Practices

Brian Brant, American Farmland Trust

American Farmland Trust is offering insurance for BMP and IPM practices. The insurance would reimburse farmers if yields fall below 5% when they give proper nutrient credit to manures.

Soil/Manure Testing Manual

Brad Joern for Gary Pierzynski

The Soil/Manure Testing Manual will be ready to be approved by the directors as soon as an Abstract is finished. The manual will only be available in electronic form.

Transport Issues Paper

Brad Joern for Bill Gburek and Andrew Sharpley

The group is working on Connectivity/Proximity for incorporation into the P Index transport factors. The USDA-ARS in Pennsylvania will fund a post-doc position to examine transport factors in the P Index.

Surface Water Response to P Loading

Wes Jarrell, Consultant.

The brochure on surface water response to P loading is finished and 5,000 copies have been printed. It is also available in electronic form in the USDA-NRCS web page and in the SERA-IEG 17 web page.

BMP Series

No report.

Business Meeting

John Lory proposed the establishment of a web site to share P-based extension publications among the states. The web site would list titles, authors, and sources for the different publications. A person from each participating state would be responsible for uploading the information to the site. The group supported the idea. Scott Morale of the Potash and Phosphate Institute indicated that PPI would be willing to list their P-based publications on the site. John Lory will contact group members in each state to identify persons that could take responsibility for this task.

Jerry Lemunyon indicated that animal scientists have developed Fact Sheets that describe how feeds can affect the P content of manures.

The group discussed the need to revise the protocol for the National P Project. Tommy Daniel, Peter Kleinman, and Phillip Moore agreed to revise the protocol and make it available to group members. Brad Joern and Miguel Cabrera will nominate group members to serve on the RTAGs for each region. Group members were encouraged to provide comments on EPA proposals being released this summer and in December of this year. Comments will be summarized by Brad Joern, Phillip Moore, and Miguel Cabrera, and will be submitted to EPA.

Wes Jarrell, Brad Joern, Dory Franklin, and Jeff Novak will provide leadership on a paper related to the land-water continuum and the landscape approach to P issues.

Frank Coale, Phillip Moore, and Miguel Cabrera will collect data on P solubility of animal manures to be made available to group members.

Michael Quart, administrative advisor to SERA-IEG 17 expressed the need for the group to establish criteria for membership in the group. These criteria should be presented to the directors together with the minutes for the meeting. He also expressed that Raymond Knight is the representative of IEG groups in CSREES and that he could be contacted to explore the possibility of making this group a national one.

The American Society of Agronomy is studying the possibility of publishing a revised edition of the P monograph. Tommy Daniel reported that members of SERA-IEG 17 are in the feasibility committee.

The group voted unanimously to accept an invitation from Pennsylvania to host the 2001 meeting of SERA-IEG 17. The meeting will be scheduled in July, trying to avoid conflicts with meetings in Animal Science, Poultry Science, Limnology and Ecology.

Doug Beegle of Pennsylvania was nominated as the incoming chair for SERA-IEG 17. The group voted unanimously to appoint him chair for 2001-2002.

The meeting was adjourned at 1:30 pm on July 29, 2000.

Respectfully submitted,

Miguel L. Cabrera
2000-2001 Chair, SERA-IEG 17

is ready to be released in electronic form. It will be released as soon as Gary finishes the Abstract