Agricultural Drainage Management Systems Task Force

Holly Springs, North Carolina
April 19-20, 2007

Opening comments

Jim Fouss opened the meeting. Robert Evans, Department Head of Biological and Agricultural Engineering at NC State University welcomed the group, and Wayne Skaggs reviewed local arrangements.

Charlie Schafer reported that ADMC is excited about drainage water management and promoting it as part of conservation plans. The new NRCS program "Ground and surface water management" presents new opportunities for cost-share, and ADMC members contributed to getting 75 producers into NRCS offices to sign up for the practice. Tade Sullivan is no longer working for ADMC. Leonard Binstock was recruited as the new Executive Director. Leonard Binstock thanked everyone and gave an overview of his background, particularly with the ADMS Task Force. He was present at the first meeting in Ames.

Mike Sullivan welcomed new NRCS representatives, especially Doug Toews, National Water Management Engineer (replacing Tom Spofford), and Ton Stevenson from the National Water Management Center. Jerry Walker is the National Technical Contact for NRCS on the Conservation Innovation Grant. Art Brate, who had been very active on the ADMS Task Force, has retired, and there is now an acting State Engineer. All other participants introduced themselves.

Katie Flahive talked about EPA funding for drainage management available in 2007. EPA is looking for ideas on ways to promote education or technical knowledge about drainage water management.

Conservation Innovation Grant to ADMC

Leonard Binstock provided an overview of the project. Project Managers from each state provided an overview of the sites, as well as a review of recent site visits by ADMC.

Indiana: Jane Frankenberger and Eileen Kladivko are project managers, and three other Purdue researchers will be involved: Sylvie Brouder, Soil Fertility specialist; Laura Bowling, Hydrologist; Jess Lowenberg-DeBoer, Ag Economist specializing in site-specific management. Three existing sites will continue, and a 4th site will be added.

Ohio: Norm Fausey and Larry Brown are leading the project. They are hoping for 16 sites, and several have been identified.

Illinois: Richard Cooke is project manager. He showed the four pairs of sites that will be in the CIG project.

Iowa: Dan Jaynes and Matt Helmers are leading the project. Dan showed the location of the four sites and reported that the Stanhope site was up and running of this week through the satellite data system provided through AgriDrain.

Minnesota: Mark Dittrich, Gary Sands, and Craig Schrader presented their three existing sites from the previous CIG grant and four additional sites for the multi-state CIG. The new flow meters appear to be working well.

1. Nitrate testing and equipment

In Ohio, nitrate data is being analyzed in the field, not the lab, because the focus is on confirming benefits found in plot studies. They have purchased Hach-type test kits that the person downloading data would use while in the field for a simple colorimetric test. It includes a pre-programmed spectrophotometer that shines a light through the sample and determines a nitrate value. The analyzing unit costs about $375, and the reagent costs about $1 each. The technician doing tests will carry a stock solution with a known value, and do calibration before each reading. The group discussed advantages and disadvantages of using this method.

Some concern was expressed that the measurements are sensitive to specific behavior such as how it is shaken, and therefore either one person needs to do all the tests, or a very specific protocol needs to be written. The analytical chemist in the Soil Drainage Unit will write protocol for doing this. There were also questions about results obtained on duplicate or split samples before. Norm Fausey will ask the chemist to prepare a 2-page report on results so far that can be distributed to others.

Conclusion: In states where labs that can do analyses using standard practices that method will continue. In other states, this method will be used.

2. Yield and flow reduction data recorded on six-inch contours

It would be beneficial to know the yield impact by 6-inch contour zones, to allow computation of yield effects within this zone. States are asked to provide yield in 6-inch contour zones. The larger question of processing yield monitor data was brought up. It would be best if all farmers followed similar practices in collecting it (calibration, spacing of measurements, etc.). The Indiana project will see if there is a protocol for collecting yield monitor data that could be given to all producers. Data should also be processed in similar ways (lag calculations, aggregation or interpolation, etc.). No conclusion was reached on how this will be done.

3. Non-perforated pipe and anti-seep collar

No standard recommendations exist for these two considerations. Illinois recommends an antiseep collar on all systems, plus 20 foot of solid pipe upstream. Minnesota recommends 20 feet up and down from structure. AgriDrain's recommendation is that it is particularly important on the last structure before the outlet.
Some asked why non-perf is needed downstream from structure. The current draft NRCS National standard, currently in the review stage, requires 10 foot non-perforated upstream. No engineering calculations or ways to take soil type into consideration have been included in recommendations. No conclusion was reached.

6. ADMC data base for CIG project

Some data from the demonstration sites will flow into a database automatically through the satellite communication. Some additional data may be entered manually. A discussion ensued on what level of data and information will be distributed. A concern for researchers involved is that data should not be released until published in peer-reviewed journals. This is important for professional advancement, and that consideration affects all we do. Although it is a demonstration project, it may not be perceived that way, since the names of five great universities are on it.

Leonard Binstock emphasized that we want to make available enough data to keep people interested, but keep the focus on outcomes. The raw data will have to be simplified, because the purpose in the proposal was to enable producers to evaluate whether they want to use the practice. We don't need every storm, and can instead provide tables of processed data, for example each 6 months for reports. Rainfall can be provided immediately to all because it is not sensitive. We need to develop tables of key outcomes like annual flow and flow-weighted concentration, that will really show the impact of the practice. That information will be the most useful to producers. More discussion needed.

Friday

Next meeting:

Fall 2007, Des Moines. Jim Fouss will send email to determine possible dates, probably in October. The meeting possibly could overlap with the Minnesota-Ohio drainage forum. (Date is not yet set for that meeting, but it is planned for Ames in October or early November.)

CSP update

Dennis Carmen has retired. Jerry Walker will have responsibility for drainage water management in CSP. The research and demonstration component has probably ended due to the continued budget resolution. Drainage water management enhancement payments are still available. Jerry will send information to Jim Fouss or directly to DrainMan listserver.

Database discussion (continued)

Mark Dittrich summarized a discussion held by several state managers the previous evening on how to provide data needed for the project while ensuring that only data that have been appropriately checked and processed be available to the public. When raw data are collected there is considerable error. Data need to be looked at first by those who are collecting the data, and need post-processing to get flow that is believable. The downside is losing the "gee-whiz" factor of real-time data. Could ways to be found to provide some data, with appropriate disclaimers? USGS real-time stations are exciting to watch because they are real-time, but there is a disclaimer about accuracy.
Conclusion: States should write down their concerns and send to Leonard. He will arrange a conference call.

DWM reported with Mississippi River Basin

Mike Sullivan reported on drainage water management practices applied in the Mississippi River Basin as documented in the NRCS Performance Results System (PRS) over the past three years. DWM was applied utilizing technical and/or financial assistance through programs such as Conservation Technical Assistance (CTA), EQiP, and CSP.More acres wee reported in FY05 that other years primarily due to a large CSP contract. It is expected that as information gets out about recent research and current demonstrations, that the acreage of DWM reported will increase.Total acreage in drainage water management within the Mississippi River Basin over three years::

Missouri:	1234
Illinois:	472
Alabama:	60
Mississippi:	50
Ohio:	29
Kentucky:	13
West Virginia:	8
Total FY04-FY06:	**1866**

NRCS overview

Doug Toews, new National Water Management Engineer, discussed his background and his vision for his new position. It includes irrigation, drainage, and water management aspects of wetland restoration. He will focus mainly on technical requirements and criteria, construction standards and specifications, and maintenance requirements. He will have indirect influence on programmatic aspects.

EPA Update

Katie Flahive reported on upcoming Hypoxia Advisory Panel meetings. The next public meeting is June 13-15 in New Orleans. The draft Science Advisory Board (SAB) report will be released before that, and public can comment any time after the report is released. Dan Jaynes gave a presentation to the SAB in the fall, and presented drainage water management and several other practices. They also received information from previous workshops that have been held. The best time to comment will be after the draft report is released.

In response to the need for more economic information, Illinois Dept of Agriculture and IDALS in Iowa are conducting case studies on specific watersheds. Task Force members should make sure that drainage water management is included in consideration. Illinois is more concerned about phosphorus and may be focusing on that concern.

She also reported on the Watershed Plan Builder, which is a tool for watershed coordinators and states to develop watershed plans.
http://www.epa.gov/owow/watershedplanning

Answering future FAQs

Gary Sands, Jane Frankenberger, and Pat Willey will discuss and possibly set up a structure for doing this. It could be a forum where questions are posted immediately, or it

could be a way for people to ask questions, that would then be compiled and answered in a more formal way. NRCS water management engineers will participate in answering them. Some questions may need to be referred to state engineers. A link to the practice standard for each state would be useful. ADMC currently links to a static copy of the practice standard, which risks being out of date if it has been revised. (They could request that states send any updates.)

Dynamic bibliography on drainage water management

A conference call was held with the National Agriculture Library after the last meeting, and the process was described for generating a bibliography. Gary Sands will generate the link, and send it to Ann Houser for posting on the ADMS web site.

More on CIG

Finances: Leonard Binstock reviewed financial management for the project. They are making every effort to make sure that the finances are clear and well documented, so ask that subcontractors fill out the same forms. Approximately 60 companies are contributing to the project. Universities pointed out that their Business Offices manage those concerns and business managers are the people with whom ADMC needs to discuss. A no-cost extension will be requested so that 3 years of data can be collected at all sites.
Communication: ADMC has contracted with CTIC to do communication.
Management during the winter: Goal would be 6 inches from the surface (at the structure or lowest point in the field that the structure is managing) for all structures in the winter. In Minnesota producers are concerned about soil temperature. This concern could be addressed if soil temperature were measured as part of the instrumentation.

Upcoming meetings and conferences

- ASA-SSSA-CSA meeting is in New Orleans. One session is being put together in honor of Wendell Gilliam.
- ASABE meeting is in Minneapolis in June.
- SWCS meeting in Tampa in July. Focus is on CEAP, and NRCS will have a very strong presence. Also a CIG Showcase.
- International Nitrogen Initiative will be in Brazil in the fall.
- The 10th International Drainage Workshop to be held in Helsinki, Finland and Tallinn, Estonia, July 6-11, 2008. Abstract submission date is May 1, 2007. More information at http://www.fincid.fi/idw2008.
- US Irrigation and Drainage Conference in Denver in June
- LICA national meeting in Nebraska July 20-21.

Future directions and theme for next meeting

A wide-ranging discussion of future opportunities and directions followed. A few of these include

- Interaction with soil fertility experts (but there are advantages in staying focused)
- Impacts on energy, since that is where the funding is
- Scaling up to the watershed scale

Needs and possible future funding from EPA

Katie Flahive presented a list of ideas she had heard during this meeting for ideas for demonstrations, training, and transfer of information, and led a discussion of the most important ideas. The ideas below were proposed:

Mini-Symposia topics

- Best practices for in-pipe/in-ditch flow measurements
- Calculate nutrient loads with flow data *to the ditch/stream*: nutrient concentration monitoring frequency
- Management strategies to reduce nitrogen loads
- Measuring nutrient reductions from the field scale at the watershed scale – improving model compatibility and developing example datasets
- Preferential flow
- Manure fertilizer and Drainage Water
- Expanding management of multiple DWM systems to interactions at the watershed scale: incorporating seepage and re-direction of water through DWM, looking at research needs and developing a plan to implement a "saturated watershed" with DWM.

Dataset Improvement

- Expanding the dataset within the Illinois Drainage Guide to all states and incorporating water quality data
- Modeling data sets for large scale topography (LIDAR): All states have need

Technical Guidance

- Document for contractor installation
- Document/manual for DRAINMOD-NII and additional training opportunities
- Contact for Drainage Water Management Questions and Answers

A long-term research need is to look at drainage water management impacts at the watershed scale. This important need would probably require millions of dollars to have a paired watershed approach. However if the group wants to work towards this, we should develop the concept to have ready for meetings where next steps and funding needs are discussed. These and other ideas should be discussed at future meetings.

The meeting was adjourned at noon.

Attendees

Leonard	Binstock	ADMC	Owatonna	MN	leobin@charter.net
Charlie	Schafer	Agri Drain Corp	Adair	IA	charlie@agridrain.com
Diana	Starr	Agri Drain Corp	Adair	IA	diana@agridrain.com
Mark	Edwards	Agriculture Canada	Ottowa	ONT	edwardsm@agr.gc.ca
David	Lapen	Agriculture Canada	Ottowa	ONT	lapend@agr.gc.ca

Mark	Sunohara	Agriculture Canada	Ottowa	ONT	sunoharam@agr.gc.ca
Mike	Hagen	Hancor, Inc			mhagen@hancor.com
John	Torbert	IA Drain Dist Assoc.	W Des Moines	IA	jtorbertidda@mchsi.com
Matthew	Helmers	Iowa State University	Ames	IA	mhelmers@iastate.edu
Ramesh	Kanwar	Iowa State University	Ames	IA	rskanwar@iastate.edu
Mark	Dittrich	MN Dept of Agric.	Saint Paul	MN	mark.dittrich@state.mn.us
Chip	Chescheur	NC State Univ	Raleigh	NC	cheschei@eos.ncsu.edu
Robert	Evans	NC State Univ	Raleigh	NC	robert_evans@ncsu.edu
Mohamed	Youssef	NC State Univ	Raleigh	NC	mohamed_youssef@ncsu.edu
Wayne	Skaggs	NC State Univ	Raleigh	NC	skaggs@eos.ncsu.edu
Ali	Madani	Nova Scotia Ag Coll.	Truro	NS	amadani@nsac.ca
Jane	Frankenberger	Purdue University	West Lafayette	IN	frankenb@purdue.edu
Eileen	Kladivko	Purdue University	West Lafayette	IN	kladivko@purdue.edu
Gary	Sands	U. Minnesota	St. Paul	MN	grsands@umn.edu
Richard	Cooke	Univ of Illinois	Urbana	IL	rcooke@uiuc.edu
Craig	Schrader	Univ. of Minn Ext	Mankato	MN	schr0118@umn.edu
Jeff	Strock	Univ. of MN	Lamberton	NM	jstrock@umn.edu
Sam	Kung	Univ. of WI-Madison	Madison	WI	ksking@wisc.edu
Katie	Flahive	US EPA	Washington	DC	flahive.katie@epa.gov
Barry	Allred	USDA/ARS	Columbus	OH	allred.13@osu.edu
Norm	Fausey	USDA-ARS	Columbus	OH	norm.fausey@ars.usda.gov
Dan	Jaynes	USDA-ARS	Ames	IA	jaynes@nstl.gov
Peter	Kleinman	USDA-ARS	University Park	PA	peter.kleinman@ars.usda.gov
Earl	Vories	USDA-ARS	Portageville	MO	voriese@missouri.edu
James	Fouss	USDA-ARS	Baton Rouge	LA	james.fouss@ars.usda.gov
Tony	Stevenson	USDA-NRCS	Little Rock	AR	tony.stevenson@ar.usda.gov
Ronald	Gronwald	USDA-NRCS	Greensboro	NC	ronald.gronwald@gnb.usda.gov
Bill	Kuenstler	USDA-NRCS	Forth Worth	TX	bill.kuenstler@ftw.usda.gov
Sheryl	Kunickis	USDA-NRCS	Washington	DC	sheryl.kunickis@wdc.usda.gov
Doug	Toews	USDA-NRCS	Washington	DC	doug.toews@wdc.usda.gov
Jerry	Walker	USDA-NRCS	Fort Worth	TX	jerry.walker@ftw.usda.gov
Pat	Willey	USDA-NRCS	Portland	OR	pat.willey@por.usda.gov
Mike	Sullivan	USDA-NRCS			michael.sullivan@wdc.usda.gov