Report on the
Forum on Minnesota Irrigated Agriculture
March 8, 2011
Saint Cloud, Minnesota

This project was supported by the Clean Water Fund
(created by the Clean Water, Land and Legacy Amendment).

Authors

East Otter Tail Soil and Water Conservation District

Darren Newville
District Manager
218-346-4260 X110

Minnesota Department of Agriculture
Pesticide and Fertilizer Management Division

Luke Stuewe
Soil Scientist
218-846-7425

Contributors

Minnesota Department of Agriculture
Pesticide and Fertilizer Management Division

Ron Struss, Fertilizer Unit Supervisor
Margaret Wagner, Environmental Outreach Coordinator

Cover Photograph

Irrigated corn field near Park Rapids, Minnesota
July 2009

Table of Contents

Executive Summary

On March 8, 2011, representatives from Minnesota's irrigated agriculture industry and state agencies participated in a Forum on Minnesota Irrigated Agriculture. The Forum was held in Saint Cloud and included discussions on:

- Challenges facing Minnesota irrigated agriculture;
- Tools and programs available to irrigators;
- Gaps and needs in education, research, and technology; and
- Recommended steps for moving Minnesota irrigated agriculture forward.

A report on the forum has been prepared by Darren Newville of the East Otter Tail Soil and Water Conservation District and Luke Stuewe of the Minnesota Department of Agriculture. Most important points of the forum are included on page 21 and are summarized below:

1. **UM Extension irrigation position**: The University of Minnesota needs an Extension position that can provide leadership to irrigation outreach and research in Minnesota. This was viewed as one of the most important issues discussed.

2. **Certification program**: The group thought a voluntary certification and education program for irrigators was a valuable concept that should be pursued.

3. **Research on new technology:** Increased research on irrigation technology is important to improve water use efficiency, increase production, and protect water resources.

4. **Inform irrigators**: It is important for local and state agencies to inform irrigators about groundwater and irrigation issues so irrigators can help in developing solutions.

5. **Balance of agricultural and environmental concerns**: The need for affordable food and the economics of farming and global markets need to be kept in mind as environmental concerns are discussed.

6. **Perceptions of general public and policy maker**s: A better understanding of issues facing farmers today is needed by the non-farming public to allow for sensible solutions to food production and environmental protection issues.

7. **Commitment to conservation**: Irrigators attending the forum understood the need for conservation efforts. They want to leave the land and water resources useable for future generations and are available to help find practical solutions to environmental concerns.

For more information on the Forum on Minnesota Irrigated Agriculture contact:

Darren Newville, East Otter Tail Soil and Water Conservation District, 218-346-4260 x110
Luke Stuewe, Minnesota Department of Agriculture, 218-846-7425

Copies of the report are available at: www.eotswcd.org (East Otter Tail SWCD).

Background

Approximately 500,000 acres of Minnesota crops are irrigated, a number which increases on average 1% annually. Predominate irrigated crops are corn (50%), soybeans (18%), potatoes (8%), and dry beans (8%)[1]. Irrigation allows for high yielding crops to be grown on drought-prone sandy texture soils and provides insurance against erratic precipitation patterns.

Most irrigated crops in Minnesota are grown on sandy textured soils which overlay shallow groundwater aquifers. If not properly managed, nutrients and pesticides used in producing crops on these permeable soils can infiltrate (leach) down and contaminate groundwater.

In December of 2010, the East Otter Tail Soil and Water Conservation District entered into an agreement with the Minnesota Department of Agriculture. The goal of the agreement is to work together to increase educational outreach and technical assistance to producers in central Minnesota, an area of sandy textured soils and shallow groundwater aquifers. Elevated nitrogen levels are regularly detected in central Minnesota groundwater. With rising concern over sustainable use of groundwater across Minnesota, and with irrigators viewed as an important stakeholder in this arena, a state-wide Forum on Minnesota Irrigated Agriculture was thought to be a beneficial event for the East Otter Tail Soil and Water Conservation District and the Minnesota Department of Agriculture to jointly undertake.

The intent of the forum was to discuss current and future irrigation and water management tools, current outreach and education efforts, current status of water quantity and quality, and the future direction of irrigation in Minnesota. Anticipated outcomes included a better understanding of available water management tools, identification of gaps in education and outreach efforts, and an awareness of current and future challenges and opportunities facing Minnesota irrigators. Angie Becker Kudelka, the Statewide Training Program Coordinator for the Minnesota Board of Soil and Water Resources, served as a neutral facilitator for the forum and assisted in both planning the event and serving as the moderator. The forum was supported by the Clean Water Fund created by the Clean Water, Land and Legacy Amendment.

Several circumstances in 2010 highlighted the need for the forum. These included:

- Significant increase in agricultural land being irrigated;
- Significant increase in first time irrigators (growers new to irrigated agriculture);
- Lack of documentation of how irrigators obtain climatic data or schedule applications;
- Increasing environmental concerns associated with irrigated agriculture;
- Unmet need for information and education on irrigation management resulting from the retirement of University of Minnesota Extension Educator Jerry Wright;
- Increasing resources available for water management through the state's Clean Water, Land and Legacy Constitutional Amendment.

[1] Data from UM Extension and Minnesota Department of Natural Resources.

Agenda

Forum on Minnesota Irrigated Agriculture

Hampton Inn and Suites
Saint Cloud, Minnesota
March 8, 2011, 9:30 a.m. – 4:00 p.m.

Agenda

1. Why are we here: Today's goals and outcomes – Luke Stuewe, MDA
2. Ground rules – Angie Becker Kudelka, BWSR
3. Identify challenges and issues for irrigation – Group discussion
4. Setting the stage – big picture analysis:
   Challenges, perceptions, and opportunities associated with irrigation – Luke Stuewe, MDA
5. Tools, programs, and knowledge levels: A Minnesota perspective – Jerry Wright, UM Retired
6. East Otter Tail SWCD workshops – Darren Newville, East Otter Tail SWCD
7. Discussion of voluntary certification program for irrigators – Group Discussion
8. Break
9. Irrigation related TMDLs and mid-summer trends – Andrew Streitz, MPCA
10. Groundwater quantity issues – Michele Walker, DNR
11. Ground water quality issues – Luke Stuewe, MDA
12. Lunch – Served on site.
13. Minnesota Department of Health issues – (Invited)
14. Irrigators perspective – Alan Peterson, IAM
15. Producers response and perspective
16. Break
17. Setting the course: Which direction are we heading? – Angie Becker Kudelka, BWSR
18. Adjourn

List of Participants

Name	Agency/Organization
Ron Nelson	Staples Ag Center
Jeff Edling	Area II Potato Growers
Frank Kasowski III	Area II Potato Growers
Tim Radatz	Discovery Farms Minnesota
Steve Inwards	East Otter Tail Soil and Water Conservation District
Darren Newville	East Otter Tail Soil and Water Conservation District
Arnold Rethemeier	East Otter Tail Soil and Water Conservation District
Jim Anderson	Irrigators Association of Minnesota
Lee Hanson	Irrigators Association of Minnesota
David Kolb	Irrigators Association of Minnesota
Alan Peterson	Irrigators Association of Minnesota
Dale Schock	Central Minnesota Irrigators Corporation
Angie Becker Kudelka	Minnesota Board of Water and Soil Resources (facilitator)
John Mages	Minnesota Corn Growers
Annie Felix- Gerth	Minnesota Department of Agriculture
Luke Stuewe	Minnesota Department of Agriculture
Michelle Walker	Minnesota Department of Natural Resources
Wayne Anderson	Minnesota Pollution Control Agency
Andrew Streitz	Minnesota Pollution Control Agency
Steve Thompson	Minnesota Pollution Control Agency
Jerry Wright	University of Minnesota (retired)

Note:

Several key individuals could not attend due to a conflict with a Minnesota Senate Agriculture and Rural Economics Committee that occurred on the same day. Included was staff from the Minnesota Department of Health and the University of Minnesota.

Challenges and Opportunities

Forum participants were given ten minutes to list challenges and opportunities facing irrigated agriculture. This exercise was conducted early in the forum to prevent answers from being influenced by the day's presentations. The following items were shared; note that an item can be identified as a challenge, an opportunity or both.

Item	Challenge	Opportunity
1. Establish a full-time position or positions within the University of Minnesota to develop and coordinate irrigation research, education and outreach, and act as an irrigation coordinator and go-to person for irrigation related issues.	X	X
2. Increase productivity (keep up with growing demand for food & fuel).	X	X
3. Increase efficiency of nutrient use (nitrogen).	X	X
4. Water quantity (maintaining enough for use).	X	
5. Tools and information used to manage irrigation (what is available, what is needed?).	X	X
6. Increase efficiency of water use.	X	X
7. Maintain and/or improve water quality.	X	
8. Balance concerns with agriculture values (environmental concerns vs. economic value).	X	X
9. Increased farming risk-due to variations in the weather.	X	
10. Outstate water quantity pressure (exporting Minnesota water sources to outside of Minnesota).	X	
11. Prioritize water use with decreased water resources (where does ag fall in priority list?).	X	
12. Increase engagement (of irrigation producers).	X	
13. Water quality goals.	X	
14. Water use conflicts (consumption, ag, industrial, recreational).	X	
15. Continuing education for farmers.	X	X
16. Allocation issues and rules (regulation).	X	X
17. Proactive fertigation/chemigation irrigation (spoon-feeding nitrogen).	X	X
18. Dollars of technology (cost could limit use of technology).	X	
19. Public environmental concerns.	X	X
20. Public education-general irrigation (lack of knowledge about irrigation practice on part of general public, irrigation seen as wasteful).	X	X
21. Slow adoption of new systems.	X	
22. Clean water funds ($).		X

(continued . . .)

Item	Challenge	Opportunity
23. Role of livestock (how this effects irrigation operations and their practices when they have livestock).	X	X
24. Increased opportunity for high value crops and diversity (with the use of irrigation).		X
25. Increased regulation.	X	X
26. Precipitation management (making sure we manage for the use of the precipitation we receive).	X	X
27. Research (increased knowledge.) Need for continued research to help develop practices that increase production and maintain water quantity and quality.		X

Later in the meeting an exercise was conducted to prioritize the above list. The group listed seven top issues:

1. Establish a full-time position or positions within the University of Minnesota to develop and coordinate irrigation research, education and outreach and act as an irrigation coordinator and go-to person for irrigation related issues.
2. Increase productivity.
3. Water quantity.
4. Tools and information used to manage irrigation.
5. Increase efficiency of water use.
6. Increase efficiency of nutrient use (nitrogen).
7. Balance concerns with agriculture values (environmental concerns vs. economic value).

Setting the Stage

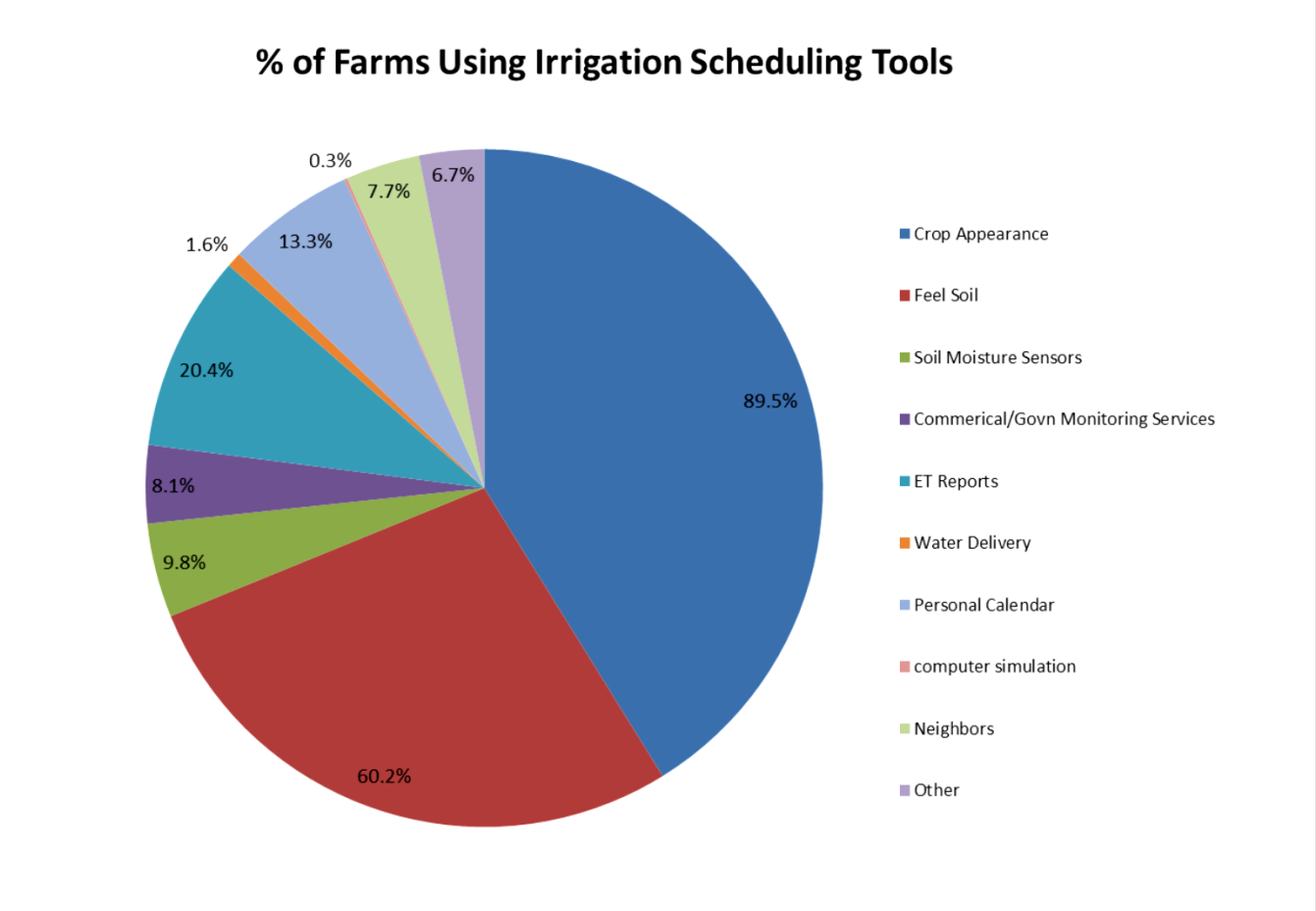
Luke Stuewe, Minnesota Department of Agriculture, set the stage for the forum. His presentation highlighted the current trends and developments in irrigated agriculture and the need for the forum to help address the challenges, perceptions and opportunities associated with irrigation.

Tools, Programs and Knowledge Levels

Jerry Wright, retired University of Minnesota Extension Educator, provided information on Irrigation Water Management Tools in Minnesota. Jerry highlighted the increase in irrigated acreage over the last ten years in Minnesota. He also discussed the need for producers to use an irrigation strategy that provides crops sufficient water to prevent plant moisture stress, but also prevents water from percolating below the root zone and leaching nitrogen into the groundwater.

Jerry gave examples of irrigation management tools including daily evapotranspiration (ET) estimators, in-field soil moisture monitoring, in-field rain gauges, and the irrigation scheduling checkbook method. The state-wide Wisconsin Irrigation Scheduler (WISP) program and the local East Otter Tail SWCD irrigation scheduler program were used as examples where these irrigation management tools were being used.

Jerry also provided the following chart on the use of irrigation scheduling tools in Minnesota reported on an estimated 1,546 farms in a 2008 USDA survey:



Local Irrigation Workshops – Voluntary certification program for irrigators

Darren Newville, East Otter Tail SWCD District Manager, provided a brief description of the irrigation workshops the East Otter Tail SWCD hosted for area producers. This provided a lead-in for small group discussions about the benefits of a voluntary certification and education program for Minnesota irrigators. Benefits and challenges to a voluntary certification program were identified during the small group discussions and are listed on the next page:

Voluntary certification and education program benefits:

1. Could improve public perception on the stewardship that irrigators employ when using water to irrigate their crops.
2. Could result in more efficient use of irrigation and increase the prosperity of individual farm operations.
3. Could serve as a vehicle to find a lead person for irrigation outreach and research in Minnesota.
4. Greater access to information could help facilitate broader adoption of new technology.
5. Could provide a consistent opportunity for irrigators to obtain updates on BMPs, new technology, and regulation.
6. Could be an opportunity for irrigators to provide input on future research related to irrigated agriculture.
7. An industry led certification program would be peer-to-peer policing to require and educate producers on proper irrigation water management.
8. Possible assurance against future regulation could be an incentive to participate.
9. Could improve communication and understanding between agencies and irrigators in Minnesota.
10. Would provide needed educational opportunities specific to producers using irrigation in Minnesota.
11. Could improve the perception that legislators have of irrigators.

Voluntary certification and education program challenges:

1. Participation by irrigators may be difficult without incentive.
2. Communicating the benefits of this certification to the public will be a challenge.
3. Finding an entity with the time and resources to lead this program may be challenging.
4. Local technical service providers (SWCD or NRCS staff) will have difficulty arranging educational events without financial support.
5. Creating a curriculum that offers meaningful content to the very diverse group of irrigators across the state will be challenging (livestock, specialty crops, etc.).
6. Cuts to UM Extension will also add challenge to arranging educational events.
7. Timing the start of a certification program will need consideration to avoid being viewed as a reaction to increased attention on irrigation (rather than a proactive initiative).
8. Figuring out if this program can/should be mandatory or whether some valuable incentive can be used to garner participation will be challenging.

Forum participants thought a voluntary certification and education program for Minnesota irrigators was a valuable concept. There were questions about who would lead the program, who would deliver the program, and where funding would come from. It was felt the program would need some type of incentive or "teeth" to get producers to participate. Suggestions included making certification a requirement to receive a permit, reducing permit fees for certificate holders or providing some assurance against future regulation or fee increases. Suggestions for funding included the Clean Water Fund, a possible 'check off' fund or somehow creating additional market value for producers that are certified. The group also felt it was important to have Irrigators Association of Minnesota (IAM) support for the program (peer-to-peer policing). One suggestion was to see if the Natural Resources Conservation Serve (NRCS) could make certification training a requirement or part of their Conservation Stewardship Program (CSP). The Minnesota Department of Agriculture was also suggested as a possible program leader.

Agency Presentations

Minnesota Pollution Control Agency (MPCA)

Andrew Strietz, MPCA Hydrologist, gave a presentation on "Hydrologic Trends in Minnesota Water Resources". His presentation focused on the altered flow study he has been working on for the time period of 1990 - 2010. In this study, Andrew looked at the concentration of appropriation permit locations and the affect the permitted appropriations may have on stream flows, especially in the months of July and August when both evaporation and plant transpiration are high, and irrigation pumping is at its maximum.

Using the stream gauge data available, Andrew found over half of the gaging stations he looked at showed statistically significant declines in summer flow. He provided several examples of streams and rivers, some with and some without statistically significant flow declines, and compared flow status to appropriation permits in the areas near these streams and rivers.

Andrew highlighted the Little Rock Creek Watershed. A groundwater model was built, to investigate the possible harmful effects of groundwater pumping, as part of a TMDL plan. The model explicitly tied pumping and stream flow together and clearly pointed out that Little Rock Creek is affected by pumping.

Minnesota Department of Natural Resources (DNR)

Michelle Walker, DNR, gave a presentation on water sustainability in Minnesota. She described the responsibilities of each state agency dealing with groundwater. The DNR's responsibility is with water supply and quantity issues; the DNR issues appropriation permits and deals with water conflicts on a case-by-case basis.

Michelle pointed out that MN Statute 103G was recently amended to assure water supply. Minnesota needs to assure that water supply is adequate for long range requirements and meets the need for sustainable water use. The 2009 legislature provided a definition for *water sustainability*; water use is sustainable when the use does not harm ecosystems, degrade water quality, or compromise the viability of future generations.

Michelle highlighted the following features of DNR's water supply program:

- Mapping to understand the distribution of surface and ground water resources (she pointed out that we still don't know a lot about our aquifers);
- Monitoring to measure changes in water supplies over time and evaluate impacts from withdrawals; and,
- Managing, which includes planning and permitting, to assure sustainable water resources for future generations (managing depends on mapping and monitoring - you can't manage what you don't understand).

Michelle also covered MN Rule 6115.0810, which establishes the development of Aquifer Management Areas. She reviewed the Aquifer Management Areas Criteria and Procedure, which includes using specifically defined areas, based hydrologic and physical characteristics and the requirement for an Aquifer Management Plan.

Minnesota Department of Agriculture (MDA)

Luke Stuewe, MDA, presented on Groundwater Water Quality in Minnesota. He provided an overview of the MDA groundwater monitoring network and described three regions of the state with sensitive groundwater resources.

Luke focused his presentation on the Central Sands region and the issues with nitrate levels in those aquifers. He highlighted the nitrate issues the City of Park Rapids is dealing with in its wellhead protection area.

Irrigators Association of Minnesota Perspective (IAM)

Alan Peterson, president of the Irrigators Association of Minnesota, presented the perspective of Minnesota irrigators. Alan expressed his surprise regarding the DNR's new 'aquifer management plan rule' that passed in the 2010 legislature. Today was the first that he had ever heard of this. He expressed some dissatisfaction with the communication efforts that DNR has made in the past to further engage irrigators in the process of groundwater management. Not hearing about this rule before today is another example of that lack of communication.

Alan explained his willingness and that of the IAM leadership to participate in state agency discussions related to groundwater and irrigation. He encouraged those representing state

agencies to seek more input from irrigators on issues that will directly affect their livelihood, such as changes to Minnesota groundwater management rules.

Alan commented on IAM's involvement in the Minnesota Agriculture Water Resources Coalition (MAWRC). He mentioned this group is engaged in TMDL related activities across the state and is tasked with voicing the concerns of Minnesota producers.

Alan explained the Discovery Farms program that recently began in Minnesota. George Rehm of Discovery Farms has talked with him about finding an irrigated farm to be a part of their on-farm monitoring network. Alan has offered his own farm, but solicited further participation from irrigators to gain a wider understanding of the emphasis that Minnesota irrigators put into scheduling and minimizing their impact on the environment.

Alan explained IAM's involvement in the Agricultural Fertilizer Research and Education Council (AFREC). This council includes representatives from the major commodity groups in Minnesota. This council collects money, through fertilizer tonnage fees, for fertilizer research and education projects in Minnesota. Since the beginning of the group three years ago, a project has yet to be proposed for irrigated ground. Alan expressed his disappointment with this and emphasized the need for more active research programs looking at irrigation and ways to increase productivity and minimize environmental impacts. Without an agricultural engineer in the UM Extension system, who focuses on irrigated agriculture, the research they need are not being proposed.

Alan mentioned the $8/million gallon fee that the DNR proposed in the 11 county metro last legislative session (2010). The funds collected were intended to increase the groundwater monitoring efforts in this region. In part due to the efforts of IAM, this proposal was not passed. IAM did not argue against monitoring, but instead suggested that the new Clean Water Fund money was a more appropriate funding source for this effort. Since the defeat of this fee increase, the DNR has moved forward with this increased monitoring effort using Clean Water Fund dollars.

In closing, Alan explained that irrigators recognize they are often located in areas of vulnerable groundwater. Alan further explained that irrigators in Minnesota use tools like soil testing, fertigation to spoon feed nitrogen, conservation tillage, cover crops and low pressure systems to minimize impacts on the environment.

Irrigation Producer Perspective

Producers were asked to respond to what they heard so far and provide their perspectives on irrigation issues. In addition to producer perspectives, comments from MDA and MPCA staff were also recorded.

Alan Peterson (IAM President): Explained the challenges that come with dry land farming. Inputs including pesticides and fertilizer are applied in the spring and maybe side dressed a little later. If the crop experiences stress or potential failure due to the lack of precipitation all of these inputs are available to leach or runoff when the weather changes and in Minnesota we generally see increased precipitation during the fall of the year. With irrigation you are able to manage this risk and provide assurance that the crop will be healthy and able to take up the inputs that are applied.

Jim Anderson (IAM member): Explained that irrigation systems are set up with power companies so that they can be shut down during the summer months when energy demand peaks. The major reason for the peaks during this time of the year is the power demand of air conditioning systems. Jim suggested that this is a societal decision to place a greater value on air conditioning then on producing food. The public's recognition of the importance of food production is a challenge for producers in Minnesota.

David Kolb (IAM member): Shared a statistic he read recently in John Deere publication that in 2050 the world will have to produce as much food as they have in the past 10,000 years to satisfy the demand of the planet's population. This is a staggering statistic and puts into perspective the necessity of high production in agriculture. David emphasized the lack of understanding amongst the general public about what farming is today and the degree of sophistication involved. Many people in the city still think of a few ducks, a goat and cow as a farm when in fact it is much, much more technical then that. We need to do a better job of educating the public about what agriculture is today and what it takes to make the food you buy in the supermarket.

Annie Felix-Gerth (MDA staff): Said the public needs to better understand the inherent risks that come with growing crops. We need farmers to produce food and farmers must use fertilizers and chemicals; even with the most prudent use, there is still risk involved.

Alan Peterson (IAM President): Explained that N-Serve is not being used by many producers in his area anymore. When he last bought anhydrous at the co-op he was told he is the only one buying N-Serve. Alan didn't know why this was the case, but proposed that fluctuating fertilizer prices (anhydrous versus urea) may be a factor. Alan wondered if producers were turning their focus away from managing nitrogen release and timing.

Steve Inwards (Irrigator): Explained in his area around Parkers Prairie that nitrogen timing and release were of the utmost importance to producers. In this area he sees producers trying new approaches and product to deal with this exact issue.

Dale Schock (CMIC member): With agricultural irrigation placed third on the list of the state's water priorities he worries it could be cut out or limited when competing priorities run into use conflicts. He has serious concerns about the implications for food production on a larger scale and Minnesota irrigators specifically who often need irrigation to produce a

crop in the areas they farm. What impact will this have on food markets and will irrigators be put out of business?

Wayne Anderson (MPCA staff): Brought forward the public pressure government is getting to clean up and protect the environment. Especially with the Clean Water Legacy Amendment passing in Minnesota, the public and legislators are now looking for results. Wayne acknowledged that on some level the public has allowed a "free pass" for production agriculture in order to provide the food we need. Current public opinion is changing though, and this situation may no longer be the case, instead the public may be looking for more accountability for environmental impacts. That being said, he does not get the sense that agriculture is looking for a free pass, but instead is asking for a fair and balanced assessment of the needs and risks involved. [The group generally agreed with this viewpoint.]

Alan Peterson (IAM President): Brought up a challenge to agencies (local, state, and federal) to use more common sense. He shared a personal story highlighting a scenario where officials wasted time and energy figuring out if they could take a producers word that there was no history of an Indian burial ground in the area of a proposed manure containment structure. This was just an example of the lack of common sense and Alan explained how significantly this sort of thing undermines that respect that a producer has for these sorts of permitting processes. Agencies need to better recognize the perception they leave. Alan suggested not just showing up on a farm when there is a problem, but instead show up to say hello and build a rapport with the producer. This will get you a lot further when you have to approach someone about an issue on their land.

John Mages (MCGA member): Commented on the demands on farmers for production to produce the world food supply and bio-fuel – need to maximize technology keeping environmental concerns in mind. He also commented that farmers do keep the environment in mind. Historical practices included erosion control methods such as terraces and filter strips. Producers understand that they need to protect the resources for future use.

Alan Peterson (IAM President): Commented that he "Hopes there is no rush to judgment on issues." Look at all the facts and factors.

It was not recorded who made the following comments:

Improved relationships with DNR are needed. DNR needs to work with clients directly.

Local projects should make sure to include or seek engagement of state organizations as a way to bring in a broader perspective on issues.

Lack of wide-spread producer participation at planning or educational events results in the same group being reached (i.e., "preaching to the choir").

Group Discussion: Education and Outreach

Participants were broken into small groups and asked to identify the current gaps in education and outreach efforts in Minnesota. The following is the list of identified gaps and who is being affected:

Gaps in Education and Outreach

Gap	Affected Group
1. Loss of University of Minnesota leadership in irrigated agriculture.	Producers and local irrigator organizations.
2. Motivation needed for irrigators to learn and get involved (need incentives and/or programs with teeth to encourage participation).	Irrigators Association of Minnesota and local irrigator organizations.
3. Lack of a connection between urban and rural communities leading to misunderstanding about what each other actually do.	All public (urban and rural).
4. There is no voluntary certification program or an identified lead to coordinate this type of program. A program could establish legitimacy for irrigators.	Irrigators, leaders of agencies involved.
5. Lack of agency knowledge of ag community.	State and county level agencies.
6. Inaccurate perception of irrigators' stewardship.	General public in irrigated areas.
7. Lack of research related to irrigated agriculture.	Farmers and the public.

The loss of irrigation leadership in education and outreach and research by the University of Minnesota was a universal theme in the small group discussions. There were three different areas where it was felt that educational efforts were needed:

- The need to educate producers on irrigation management methods, tools and technology. The concept of an irrigation certification program was again brought up.
- The need to educate the general public on agricultural practices including irrigation practices. There was a consensus on the need to connect urban and rural populations because the general public is moving further away from the farm.
- There is a need to educate state agency personnel and policy makers on agricultural issues including demand for food and general agricultural practices.

The groups were then asked to make recommendations on how to address these gaps. The list of those recommendations is on the next page:

Recommendations for Education and Outreach

1. The MDA and UM Extension should create or resurrect a leadership position in the irrigation arena.
2. MDA could take the lead on a certification program with IAM as a partner - Use Clean Water Fund dollars to help fund efforts.
3. Define a value of the certification program; what value is it to producers? (Possible example, reduced cost for permits.)
4. Define benchmarks for educational programs; learn from other programs like pesticide certification or pork producer's educational certification program.
5. Potential leadership for certification program: Irrigators Association of Minnesota.
6. Educating general public with program such as Farming 101 and Discovery Farms.
7. Better hiring by state and local agencies; hiring people with ag backgrounds or educating staff on agricultural issues and practices.
8. School-based educational efforts for general public on agriculture, e.g., water festival, Minnesota State Fair's Eco Experience, SWCD, DNR, others.
9. Develop brochure on ag practices to be distributed to general public (example of brochure that was delivered through area resorts).

Other General Outreach Recommendations

1. Use Discovery Farms as an educational opportunity (for both the ag and non-ag communities).
2. Articles from state agencies to irrigator newsletter on water issues.
3. Publish stories of good agricultural leaders in local paper (stories on ag management practices).

Group Discussion: Tools

The small groups were asked to discuss tools used by producers for irrigation management and compile a list those that might be needed or are missing. The following is the list compiled from the groups:

Tools Needed or Missing

1. A full-time position within University of Minnesota to develop and coordinate irrigation research and serve as an irrigation coordinator and go-to person for irrigation related issues.
2. More weather station/ ET (evapotranspiration) data in the irrigated regions of Minnesota.
3. Simple irrigation scheduling system (checkbook method) updated to today's technology (e.g., an iPhone app).
4. New irrigation research conducted and disseminated.

5. Precision ag tools for irrigation scheduling that provide economic return.
6. A better established leaf test for in-season nutrient management (more research is needed here).
7. Increased soil moisture monitoring by producers.
8. Dependable and accurate field moisture sensors for irrigated fields.
9. More promotion of basal stalk nitrogen testing to evaluate nitrogen use on corn.

The groups were then asked to prioritize the list of identified tools to highlight what they felt were the most important.

Prioritized Tools (from above list)

Top priority:

- A full-time position within the University of Minnesota system to develop and coordinate irrigation research and serve as an irrigation coordinator and go-to person for irrigation related issues.

High priority:

- Simple irrigation scheduling system (checkbook method) updated to today's technology (e.g., an iPhone app).
- More weather station/ ET data in the irrigated regions of Minnesota.
- New irrigation research conducted and disseminated.

The groups also listed which of these tools might be cost limiting. The following is the list compiled from that discussion:

Cost Limiting Tools

1. A full-time position within the University of Minnesota system to develop and coordinate irrigation research and serve as an irrigation coordinator and go-to person for irrigation related issues.
2. Precision ag tools for irrigation water application; still cost-prohibitive for many.
3. A local service provider to assist irrigators with scheduling water application on their individual fields.
4. Local weather stations to provide necessary data for ET estimates. Rainfall varies greatly and more stations are needed to capture this variation.
5. Research on irrigated fields.
6. Remote access technology that enables producers to run irrigation systems from their office.
7. The equipment investment needed to be able to fertigate and the cost of liquid fertilizer (these are cost limiting for some producers to utilize this BMP).

General Recommendations and Considerations

The following list of general recommendation and considerations was developed throughout the day:

1. State agencies should share data and ground water issues with producers and producer groups;
2. Think broadly about a possible University of Minnesota Extension position for irrigation. Exclusive focus on irrigation may not be possible, need to think of other related issues that this person could be involved in;
3. Relate voluntary certification to University of Minnesota leadership position;
4. Form more ag/urban connections to educate one another;
5. Organize goals and set clear priorities; and
6. Invite elected officials and agencies to view farming operations.

Next Steps

The participants concluded the meeting by compiling a list of next steps and identifying people that may be responsible or willing to participate:

Step	Who
Provide a summary report of the forum report to all forum participants.	Darren Newville, EOT SWCD Luke Stuewe, MDA
Presentation of the irrigation forum findings to MDA and University of Minnesota leadership.	Darren Newville, EOT SWCD Luke Stuewe, MDA Allen Peterson, IAM
Monitor opportunities to use MDA's Clean Water Fund dollars to fill gaps identified by this forum.	Luke Stuewe, MDA
Complete a survey of irrigators in Minnesota.	Darren Newville, EOT SWCD Luke Stuewe, MDA
Assist with piloting a draft version of the above irrigator survey.	John Mages, MCGA and Jim Anderson, IAM
Provide advisory input on specific issues raised in this forum.	IAM

Most Important Points from the Forum:

- **UM Extension irrigation position**: The group agreed strongly that a University of Minnesota Extension position is needed to provide leadership to irrigation outreach and research in Minnesota. This message was reiterated at several points throughout the forum. Irrigation is an important asset to Minnesota agriculture and also an important stakeholder in the sustainable use and protection of Minnesota groundwater. A neutral player such as the University of Minnesota is needed to facilitate the important irrigation research and outreach required by this sector of Minnesota agriculture. Both the University of Minnesota and Minnesota Department of Agriculture were viewed as important players to initiate an Extension position. A face-to-face meeting with key people in leadership with each organization was recommended to convey this message.

- **Certification program**: Both new and experienced irrigators would benefit from an ongoing voluntary certification program that provides training and updates on irrigation research. Such a program would provide public assurance that irrigators are trained and invested in the proper use of irrigation water. The group agreed a voluntary certification and education program for irrigators was a valuable concept to pursue. There were questions about who would lead the program, who would deliver the program and where funding would come from. Participants believed the program would need some type of incentive to get producers to participate. Suggestions included making certification a requirement to receive a groundwater appropriation permit, reducing permit fees for certificate holders, or providing some assurance against fee increases or additional regulation. The group also felt it was important to have IAM support for the program (peer-to-peer policing).

- **Research on new technology:** The group agreed that increased research on irrigation technology is important to improve water use efficiency, increase agricultural production and enhance protection of water resources. Existing tools, such as ET weathers station data and irrigation scheduling tools need to be expanded and updated to meet current needs and technology.

- **Keep irrigators informed**: It is important for local and state government agencies to inform irrigators about issues concerning groundwater and irrigation so programs and policies can benefit from the irrigator's knowledge and experience. The group agreed it is important for irrigators be included in water resource management programs from the very start. Two recent examples where that did not occur are the MPCA stream flow modeling project and the DNR aquifer management plan rule. Both were in the process of being implemented before the IAM was made aware of their existence.

- **Balance of agricultural and environmental concerns**: The need for affordable food and the economics of farming and global markets need to be kept in mind as environmental concerns are discussed. Maintaining a profitable farming sector is critical to our state's economy. A balanced discussion on agricultural and environmental concerns is imperative moving forward.

- **Perceptions of general public and policy maker**s: As society moves further away from the farm there is a growing need to educate the general public and policy makers on what agriculture is today. The conservation, efficiency, and careful management that goes into a modern farm to meet the production needs of our population is exceptional. A better understanding of issues facing farmers today is needed by the non-farming public to allow for sensible solutions to food production and environmental protection issues.

- **Commitment to conservation**: Irrigators attending the forum understood the need for a balance in production and conservation efforts. They want to leave the land and water resources useable for future generations. Irrigators are willing and available to help local and state agencies find practical solutions to environmental concerns facing their industry.

- End of Report -