Report: Idaho Dairy Pilot Test

Livestock Environmental Management System

DATA, FINDINGS AND TENTATIVE CONCLUSIONS TAKEN FROM DEPTH INTERVIEWS
THE FIFTEEN MILE WATERSHED
CANYON AND ADA COUNTIES, IDAHO
JUNE 30 – JULY 3, 2003

The Idaho Livestock Environmental Management System pilot team developed a pilot test purpose statement from the lead definition of an Environmental Management System (EMS) taken from the brochure Agricultural Management Systems, page 2.

“(EMS) is a business management system that helps you develop your own strategy for integrating environmental considerations into production decisions.”

The data, findings and conclusions in this report are limited to a depth-interview questionnaire of 32 questions regarding agricultural producers’ understandings of the perceived value of an Environmental Management System (EMS) to their operations. This questionnaire was developed and fielded by the Idaho EMS pilot team to supplement the evaluation materials developed by the national EMS team. The national EMS evaluation materials were fielded and collected by the Idaho team according to the established national protocol. These national evaluation materials are submitted, along with this Idaho depth-interview report, to the Partnerships for Livestock Environmental Management Assessment Systems project at the University of Wisconsin.

Objective and scope of the Idaho EMS pilot test
The objective of the Idaho pilot test was to identify, among small sized regulated dairies, producer opinions regarding the adoption of a voluntary self-directed Environmental Management System. The Idaho pilot test was designed to give producers an opportunity to complete in a single day a condensed version of an EMS. The Idaho pilot test was limited in scope to dairies of 65 to 400 milk cows in a watershed that has met current TMDL requirements. Eleven dairy owners agreed to participate. All participants recently completed the Idaho Department of Agriculture Comprehensive Nutrient Management Plan as required by the Idaho Legislature under an agreement with Idaho Department of Environmental Quality and the Idaho Dairy Association.

Pilot test materials
The Idaho EMS team developed two condensed versions of the national Guidebook and Workbook materials.

1) The Idaho Condensed Workbook (Appendix A) is a 25-page material similar in scope to the Virginia Polytechnical Institute and State University and the University of Georgia condensed materials. The Idaho Condensed Workbook is an all-inclusive material that includes EMS descriptive language, workbook sheets and instructions. No new materials or language were developed by the Idaho team. The Idaho Condensed Workbook presents a self-directed format in which workbook materials are sequenced together with guidebook lesson information. This allows the producer to work smoothly through the condensed materials without referencing from one page, lesson, or material to another.

2) The Idaho Reference Guidebook (Appendix B) is a 50-page material, which contains the greater portion of the national Guidebook descriptive and explanatory language except for workbook instructions and materials.
The Idaho team developed two evaluation questionnaires:

1) A depth interview 32-question survey instrument. This questionnaire was used to evaluate stakeholders’ opinions (Appendix E) and producers’ opinions (Appendix C) regarding the use of an EMS to integrate environmental considerations into production decisions.

2) A simple ease-of-use survey instrument. This questionnaire was used to evaluate producer ease-of-use with the Idaho Condensed Workbook. (Appendix D).

**Resource description of the Fifteen Mile Watershed**

The Fifteenmile Creek Subwatershed encompasses 45,250 acres. It includes the lower portions of both Fivemile and Tenmile Creek from the New York Canal to their confluence at Fifteenmile Creek in addition to various portions of contributing canal subwatersheds. Both creeks flow in a northwesterly direction from the New York Canal in Ada County toward the Boise River before combining to form Fifteenmile Creek in Canyon County. Fifteenmile Creek continues for about 4 miles before its confluence with the Boise River near the city of Middleton. Portions of Boise, as well as the majority of the city of Meridian are located within the Fifteenmile Creek Subwatershed boundary. The Total Maximum Daily Load (TMDL) implementation plan addresses the nonpoint, agricultural sources of sediment, nutrients, and bacteria that impact the Lower Boise River from Fifteenmile Creek.

**Idaho protocol**

Over a period of four days, ten dairy producers kept individual appointments with the Idaho team at two NRCS field offices to pilot test the Idaho EMS materials. The team traveled and met with one additional producer at his dairy. The producers had previously reviewed two EMS brochures. Two or three team members met with each producer and discussed the history of the project, ISO certification opportunities, and the Idaho project’s objective. Team members stressed the importance of the individual producer’s workbook effort and the importance of the four evaluation materials. The producers understood that only eleven individuals would greatly determine the relevance of a small-scale EMS planning tool to an operation of their size in a similar resource area. No time limits were set for the discussion, the workbook completion or the evaluations. When the discussion ended, the producer completed the pilot test materials in the following order:

- The Idaho Condensed Workbook (Appendix A)
- The Idaho Reference Guidebook, available as needed (Appendix B)
- A Modified Georgia Version of the EMS Wisconsin Producer Survey (submitted to Partnerships for Environmental Management Systems)
- The Idaho Depth-Interview Questionnaire of 32 questions and probes constructed with multiple questions pertaining to the general concepts of environmental issues, planning, regulation, stewardship and cost/benefit issues. (Appendix C)
- The Idaho Ease-of-Use Questionnaire (Appendix D)
- The EMS Wisconsin Producer Survey (demographic information/submitted to Partnerships for Environmental Management Systems)

Prior to the pilot test, the Idaho team pre-tested the Idaho Condensed Workbook and The Idaho Reference Guidebook with 12 Idaho stakeholders at the Idaho EMS Stakeholders’ Meeting on June 17, 2003. Stakeholders included representatives from the Natural Resources Conservation Service, Idaho Environmental Protection Agency, Idaho Department of Environmental Quality, University of Idaho, Idaho State Department of Agriculture, Idaho Cattle Association and Idaho Dairymen’s Association. Following an EMS presentation, the stakeholders completed the Idaho Condensed Workbook and the EMS Wisconsin Stakeholder Survey. These surveys are being submitted, along with the Producer Surveys, to the Partnerships for Environmental Management Systems according to their protocol instructions. Six of the stakeholders completed the Idaho Depth-Interview Questionnaire as a paper-based survey instrument. Tentative conclusions are found in this report. This survey instrument and findings are found in Appendix E.
Evaluation analysis: the diffusion of innovation model

The Idaho team selected the diffusion of innovation model as the basis of analysis for the depth interview data. The effects of the perceived attributes of an innovation (compatibility, relative advantage, trialability, observability, and complexity) on the rate of adoption have been studied as independent variables in more than 2,000 empirical diffusion research studies, a significant number of them agricultural.

Diffusion of innovation research (Rogers, 1883) generally defines an innovation as an idea or practice that is perceived as new to an individual. The Ryan & Gross (1943) study of the adoption process following the introduction of hybrid seed corn among Iowa farmers in 1928 formed the classic diffusion paradigm.

Innovation attributes

Compatibility is the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters. The rate of adoption of a new idea is affected by the old idea that it supersedes. Old ideas are the mental tools that individuals utilize to assess new ideas. One cannot deal with an innovation except on the basis of the familiar. Hence, positive experiences with a previous practice can increase the rate of adoption of the innovation. Regarding a compatibility with needs, potential adopters may not recognize a need for an innovation until they become familiar with the new idea.

Relative advantage is the degree to which an innovation is perceived as better than the idea it supersedes. Relative advantage can be expressed as economic profitability, low initial cost, a decrease in discomfort, social prestige, a saving in time and effort, the immediacy of the reward, little risk, and the prevention of an unwanted event. Incentives to encourage behavior change can also increase the rate of adoption.

Trialability is the degree to which an innovation may be experimented with on a limited basis. New ideas that can be tried on an installment plan are generally adopted more readily than practices that must be adopt as a whole. A personal trying-out of an innovation gives meaning to the innovation by letting one find out how it works under one’s own conditions. This trial behavior helps dispel uncertainty, especially among early adopters.

Observability is the degree to which the results of an innovation are visible and can be described to others. Observability is a characteristic that promotes adoption among later adopters who can observe earlier peer success with the adoption.

Complexity is the degree to which an innovation is perceived as difficult to understand and use. An innovation that is easily understood will increase the rate of adoption.

Farmer adoption decision factors

Ten farmer adoption decision factors were identified from a coding of the manifest content of the depth interviews: Conservation values/stewardship; planning/future orientation; environmental concerns; solutions/practice selection/options; practice costs versus productivity benefits; regulatory issues; environmental liability; technical help; information availability; and financial help.

These factors, named farmer adoption decision factors in this study, were then assigned to the appropriate perceived attributes of an innovation. The table below describes the results of this approach.

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<tr>
<th>Innovation attributes</th>
<th>Farmer adoption decision factors</th>
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<tr>
<td>1. Compatibility (with cultural values, past)</td>
<td>1.1 Conservation values/stewardship</td>
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<td>Experiences and needs)</td>
<td>1.2 Planning/future orientation</td>
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<td>1.3 Environmental concerns</td>
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<td>2. Relative advantage (the degree to which the innovation is perceived as better than the idea it supersedes)</td>
<td>2.1 Solutions, practice selection/options</td>
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<td>2.5 Technical help</td>
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<td>2.6 Information availability</td>
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<td>2.7 Financial help</td>
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<td>3. Trialability (entry level use on a limited basis)</td>
<td>(Inherent in EMS approach)</td>
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<td>4. Observability (visibility of results)</td>
<td>not available</td>
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<td>5. Complexity (degree to which the innovation is easy to use)</td>
<td>(Appendix D)</td>
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**Tentative conclusions – Idaho Dairy producers**

These tentative conclusions are based on latent interpretation of the raw data (pages 5-9) which taps the underlying meaning of communication; however, this advantage may come at a cost of reliability and specificity. The analysis of the data from the EMS Wisconsin surveys submitted with this report will provide the national team with additional evaluation material.

An EMS approach has some degree of compatibility with the Idaho producers' cultural values and past experiences, but the concepts articulated as conservation values and stewardship are not perceived as stand-alone values; they are perceived as unsought but advantageous outcomes of financially successful farming practices and a personal and cultural value system related to the health and safety of family and farmstead. Producers tended to discuss the term environmental in terms of a specific locus; their own ground; "a safe place," as one producer stated. These producers see the environment as exceedingly local, as homestead and farm.

A common favorable opinion occurring throughout the interviews was the capability of the EMS approach to help identify problems. A number of producers responded that the solutions are available; the difficulty is identifying the problem. Problem solving is an active cognitive process that leads to opinion formation and behavior.

Producers frequently stated the EMS approach made them more aware of environmental issues. While opinion research holds that awareness is a passive cognitive activity and, by itself, is not a precursor to behavior, awareness is nonetheless the first cognitive step toward problem solving.

Producers found the opportunity to revise an EMS plan a strong advantage to adoption. They frequently stated a generalized anxiety regarding change. They appeared averse to planning that locked in future behavior. While EMS planning was seen as particularly advantageous to problem solving, direct environmental conservation action was not mentioned as a planning outcome.

Questions pertaining to environmental liability protection drew strong positive statements. These statements also can be linked to the EMS’s problem solving capability. Environmental liability protection could be the primary specific cause for adoption of an EMS by this target public.
A number of producers offered the opinion, without prompting, that an EMS held a public relations value to dealing with external publics.

The cost/benefit questions did not resonate with most producers, but there were favorable opinions – one might call them favorable “suspicions” - regarding the future productivity value of an EMS. This could be linked to the perceived value of an EMS as a problem-solving tool.

Regulatory issues prompted little discussion, as Idaho producers are already self-regulated by their own industry. The EMS does not offer immediate regulatory certainty.

In sum, the EMS approach appears compatible with these producers in terms of creating environmental awareness and solving a generalized need for a problem solving mechanism; however, the EMS approach did not satisfy a need for problem-solving information. The EMS approach is seen as particularly advantageous as a public relations tool and as a potential environmental liability protection document. An EMS was not perceived as causing a financial concern. The voluntary and confidential aspects of an EMS approach create a situation whereby the operator can limit, expand or amend the EMS as often as needed. However, observable successes of EMSs at the producer level are not available and this factor limits adoption. Six producers completed a brief ease-of-use questionnaire. There was consensus that an EMS was easy to use, understandable, and required no special knowledge. However, there was also consensus that an EMS was not enjoyable or pleasant to use (see Appendix D for Ease-of-Use findings).

**Tentative conclusions - Idaho stakeholders**

*Because this portion of the stakeholders’ meeting was a pre-pilot test of the Idaho pilot materials, and because the stakeholders had already completed the national Stakeholder Survey, they were asked to respond to the depth-interview questionnaire as a hypothetical dairy producer (see Appendix D).*

Similar to the opinions stated by the producers, the stakeholders responded most strongly to the changeable planning opportunity offered by an EMS. Interestingly, the stakeholders also were in agreement with the producers’ opinions that a) an EMS could address their environmental liability concerns, and b) it is important to have a product that addresses environmental liability.

**Raw Data Excerpts**

*All producer statements that lent themselves to latent interpretation have been assigned to the relevant farmer adoption decision factors below. Producers’ responses of the yes, no or maybe type are entered, along with these raw data excerpts, on the depth interview questionnaire (Appendix D). It is important to keep in mind that the producers’ statements below are responses to questions pertaining to their perceived value of an EMS to their operations.*

1. **Compatibility** with cultural values, past experiences and needs.

1.1 **Conservation values/stewardship**

. Yes, appearances are not regulatory.
. I think there is a difference between the family farm and the corporate farm. Most people of the family farm have the values that are important to the environment. We were not raising livestock. We were raising kids. And now that my last kid is almost grown, I will raise our grandchildren with these values.
. (Conservation values) are already there in Idaho.
. Sure, it makes you think along those lines.
. Our stewardship values are of the highest priority without an EMS.
I really believe that small producers are more important to the environment. What could be better for the environment and neighbors than a small operation – no odors, no (etc.).

1.2 Planning/future orientation
(On your farm) first you need to identify the problem, then you go to the solution. If the list of problems don’t really apply to you, you don’t want to go any deeper.

(LEMS helped me identify concerns) with checks and balances.
(LEMS) made me more aware.
(LEMS) really addresses problems for huge operations.
(LEMS) causes you to think. You can take it home and say, what do you guys think?
(There is) an expense of putting it all together.
That was a little confusing. We’re revising a pumping station. Yes, it helps name a place.
Change would be easy. Implementing would take time.
(You) can change as things change.
I am thinking of other things we could implement. Manure management is a concern.
So much of this won’t apply.
It has to be constantly changing because everything else changes.
(I can plan) definitely some time into the future (with LEMS) but not five years. A lot can happen in five years.
Plans by definition change. You could use it as a benchmark for improvement.
Everything changes. It has to be flexible. In two years you have all different employees.
I plan in order to be morally responsible.
I plan to divert pressure.
I plan for profit. So I can stay on my farm.
(I plan) to be safe. It is where you live.
I think it is important. It causes a person to think. Sometimes we ignore and this makes you do it. The forms are especially important to make you (think).
(I think I will put my EMS into motion for) benchmarking, public relations.
Something shouldn’t take two years to get done.
(I will put my EMS into motion) because I was going to (plan) anyway.
I like the farm’s “operating purpose.” I like the idea of a mission statement. I think it would be good to have some environmental priorities such as managing your spraying operation better.
If you have one of these you are better prepared for what comes along. I came home one day and Channel 7 was there. (The EMS would help.)
For a small farm, we are so efficient that to implement any more of this other than to make your operation better is … You really only need common sense and a love for your land and livestock and profit for future improvements.
Further implementation of nonsense like this will push smaller producers out. We are exhausted with “management systems” offered up as help and non-regulatory alternatives to fix problems. I have yet to see any so called voluntary BMPs. They all become mandatory. This plan leaves nothing to the lifetime of experience most farmers have, everything is planned by someone who has never worked a day on the specific operation in question. Taking our time is a huge impact on us.

1.3 Environmental concerns
(LEMS) addressed all of them.
You could pick another issue if you wanted. The idea of the plan was to make you think and identify problems.
We want to provide a safe place so we want to keep it in good condition.
No, I didn’t think everything was on it.
It addresses mostly concerns I don’t have. (Such as) large amounts of dead animals.
It stimulates my thinking and you can get another’s views.
2. Relative Advantage

2.1 Solutions, practice selection/options

I went to school last week, all week. The school of hard knocks. I had 43 dead animals (on the farm last week.) (My uncle had transferred the counter from the drum and put it in the wrong sack) and it looked like iodized salt (and we fed it.) On the way to Idaho Mortality my nose told me what had happened. I understand now the reasons for checks and balances. I didn’t understand in Denver. I thought on a small farm you don’t have the need for checks and balances but...

. I need a more detailed (plan), (then) I could fill out more.
. It was just a start.
. It make me aware of some things I hadn’t though of that could use implementation.
. It made me aware of a couple of things, such as farm appearance. The more people are moving and driving by, that makes a difference.
. Made me more aware.
. Made me more aware of the things that are there.
. We would have to do more than what I am doing, that’s for sure.
. There were no solutions.
. It made me more aware of problems, solutions.
. The solutions are already there (in your mind) if you know what the problems are.
. It provokes though and then you come up with solutions for you and your family. Again, I am living there. If you live in town, you aren’t attached to the neighbors. So you don’t see the neighbors when you drop manure in front of their yard. Our son got sick, so we water-tested for ourselves.

. If you are aware of the problems, then the solutions are obvious.
. I think you have to identify the problem. Solutions are a whole different chapter.
. An EMS is a public relations tool. It’s an image improver.
. It helped me prioritize.
. That voluntary aspect appeals to me a lot. My solutions are more voluntary.
. I didn’t see a limit to solutions. Actually, it opened up a broader perspective.
. I think the gist of this is rural. Out in our (sub-division encroached) area, before our area changed, I’d go across the road and ask, “How are the flies?”
. I would recommend an EMS to other producers. Helps you see things differently, an opportunity to head off problems.
. I will not implement due to cost and can’t afford the expense. I would not recommend an EMS to other producers.

2.2 Practice costs vs. productivity benefits

. It leaves out the cost element.
. There are certain things we work on. We have to stay viable.
. (EMS) doesn’t change the bottom line.
. (I don’t see any) right off the bat.
. (Probably profitable because) if you had a plan and stuck to it, if everybody in the operation was on the same page, there would be less slippage.
. I am using water as an example. Any time you can save water, especially in a water-short year, it is profitable.
. (Productivity benefits?) absolutely none.
. I think you don’t see (productivity benefits) up front but you see it afterwards. It might prevent a huge cost down the road that you don’t see right now.
. You don’t get any more pay and you get more expense.
. Everybody would be more efficient.
. Generally, when you add something like this, it adds one more thing to do.
. (It would increase training) a little bit.
. (Re increased training) I don’t think so. Just the seminars through NRCS.
. (Re increased training) I’m sure.
. (Re increased training) I don’t think so.
. (Re increased workload) It depends on the size of the workload. It would have to be a big task to not consider taking it on.
. (Re increased workload) It’s a dollars and cents thing. Need to see the benefit.
. (Re applying for multiple farm benefits) Once you implement a plan, the focus becomes much more obvious.
. We’re out there operating on a low margin. You’re trying to hold on and wait for better times. You’re just trying to (survive). It takes two things to fix (an operation) – time and money. Is there an incentive to do it? If you want me to go beyond the letter of the law, the government better pay 100%. This is survival. They are asking us to divert money from feeding our family. We’re talking about survival on family farms. I have paid for everything myself (no government cost-share) but I am not going one step beyond because the government says I have to be a good steward. The margins are razor thin. If the government wants us to go beyond, I won’t pay one penny more! People are driven by finances. You have to meet a need to get people off dead center. I don’t need a plan to tell me to do more. We’ve spent the money.
. Very time consuming and costly. It would be a loss of my time actually producing a product and more time spent keeping written records, resulting in less time to nurse sick cows, breed, head detect, clean pens and many other things. Ag is labor intensive. Computers and desks and chairs don’t get the cows observed!

2.3 Regulatory status.
. This appears to be voluntary. A voluntary plan makes you think a little different than you normally would.
. (With EMS) there is the potential decrease in regulation. Also, the perception that you are certified.

2.4 Environmental liability
. If you had a plan, that would help you a little.
. Yes, because this process will take research and that is good.
. Yes, I suppose having a plan decreases liability.
. Probably help decrease liability. I would be looking for ways to make things safer.
. I don’t know if there is any way to eliminate liability no matter what you say or do.
. By doing this, you increase costs but it reduces the chance of a big wreck down the road.
. I think (such a plan) is important, given the perception from the non-ag community.
. Yes, you have to have a plan in this day and age.
. Today, the Department of Ag. got the sixth complaint call (about me) from the same person. Enough of my nutrient management plan is public that it becomes a tool for someone to harass me.

2.5 Technical help
. This (and financial help) is not a priority. Regulation is (more important).
. Additional help is always a plus.
. What we are lacking in the industry is the technological support (the technological advances). Last two years millions of dollars have been spent drying to solve (problems). Digesters are not the answers. Reverse osmosis is not working. The technology is not there.

2.6 Information availability
. Stimulated my thinking.
. There was no information.
. None other than the (idea) of more environmental regulation.
. That’s what you need to solve a problem: money and knowledge.
. Regarding the EMS, I need more information to commit. Technical information is needed to implement. What was best about the EMS process? “the thought process.”
. I can't implement because need more information.

2.7 Financial help

. (EMS) would have to be paid for.
. There are benefits anytime you plan. It looks good to a financial institution.
. (Re CSP) I don’t think they should pay someone twice.
. (Re CSP) If you’ve done it, then it is it's own reward. We're not used to getting paid for all we do.
. (Re CSP) I don’t always agree that going back and rewarding people is a good thing. I have mixed feeling about it.
. (Re CSP) I think there are benefits there.
. (For things) I come up with voluntarily, the financial end isn’t a big consideration.
. (An EMS would help me financially) if I was willing to put in the time, sure.
. (An EMS) would make (financial help) easier.
. You would have to have (financial assistance to do an EMS)
. If you commit to yourself, then you are obligated to yourself.
. (EMS) makes you think of avoiding future costs by being on top of problems rather than just waiting for the problems to happen and then pay for them.
. I did not see any obligation (to spend money). But by being morally responsible, you are obligated.

3. Trialability

No data. However, the voluntary and confidential aspects of an EMS approach create a situation whereby the operator can limit, expand or amend the EMS as often as needed.

4. Observability

No data.

5. Complexity

See Ease-of-Use data (Appendix D)