5-18-2005

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This is not a peer-reviewed article.
Livestock Environment VII,
Proceedings of the Seventh International Symposium, 18-20 May 2005 (Beijing, China)
Publication Date 18 May 2005, ASAE Publication Number 701P0205.

USING EMS'S TO IMPROVE COMPLIANCE ON LIVESTOCK AND POULTRY OPERATIONS

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ABSTRACT

Across the United States and abroad, innovative producers, processors, trade organizations and others in the agricultural sector are exploring the promise of Environmental Management Systems (EMS) to improve their environmental and business performance. An Environmental Management System or EMS helps farmers develop their own, personal strategies for reducing environmental risk on their operations by integrating environmental management considerations into production management decisions. It is a voluntary, flexible approach and is based on a producer's own sense of how best to manage an operation.

Partnerships for Livestock Environmental Management Systems is a 4-year project to explore the potential of livestock Environmental Management Systems to help prevent non-point pollution and resolve community and regulatory concerns. The project goal is to develop and evaluate environmental management tools and procedures with which livestock producers can address local priority water and air quality issues. Using these tools, cooperators from nine states developed EMS's with more than 100 dairy, beef, and poultry producers. Surveys were used to assess the impacts of EMS development on the producers and interviews indicated the farmer's perceptions of the EMS's on their operations. Each of the nine states (Iowa, Montana, Texas, Idaho, New York, Wisconsin, Georgia, Pennsylvania and Virginia) approached differently the educational task of helping farmers recognize the value of an EMS and embrace its development and implementation. The evaluation seeks to tease out which educational approaches and strategies worked best by studying both the educators' practices and the farmers' responses and perceptions. Preliminary results indicate that EMS can benefit some operations and that larger operations view EMS's as a method of maintaining compliance, improving management, and demonstrating their environmental stewardship.

KEYWORDS. EMS, Environmental Management Systems, compliance, waste management, water quality

INTRODUCTION

The International Organization for Standardization (ISO) has been developing voluntary technical standards over most sectors of business, industry and technology since 1947. ISO standards are developed primarily for the purpose of facilitating international exchange of goods. In 1996, the ISO produced a series of international environmental performance standards (the "14000" family of standards) that include a standard for "Environmental Management Systems" known as "ISO 14001." This series is a generic management system that can be applied to any organization regardless of the size of the industry or the product. The ISO 14000 series deals

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primarily with environmental management and with improving the process of creating a product and not the final product itself (ISO, 2003). According to the ISO organization, ISO 14001 addresses numerous aspects of environmental management including organizational structure, responsibilities and practices, and also evaluates steps taken to create, maintain, and improve environmental policies within a company. As of December 2003, nearly 3,500 companies in the U.S. were ISO 14001 certified, with more than 61,000 companies certified worldwide. As a result of this growing profile of the ISO 14001 standard for an Environmental Management System (EMS), innovative producers, processors, trade organizations and others in the agricultural sector are exploring the promise of EMS to improve their environmental and business performance. Some of the marks of this growing interest include a Presidential directive for all federal agencies to implement EMSs for applicable facilities (Executive Order 13148 issued by President Clinton and sustained by President Bush). The U.S. Environmental Protection Agency has issued a policy on Environmental Management Systems, and has funded several pilot programs and exploratory conversations for EMS implementation by the agricultural sector.

Several agricultural initiatives in EMS development have recently occurred in the U.S. and worldwide. U.S. EPA, State water officials, environmental groups and others are participating in a project with the United Egg Producers (UEP) to develop a comprehensive program to help participating facilities achieve "superior environmental performance" by implementing an environmental management system (EMS), http://www.epa.gov/projectxl/uep/. Similarly, EPA has an agreement with the North Carolina Division of Pollution Prevention and Environmental Assistance and Smithfield Foods to test and solidify an Environmental Management Systems protocol for swine producers (http://www.p2pays.org/iso/sector/pork.htm). Commodity organizations showing a growing interest in Environmental Management Systems include the American and Iowa Soybean Associations (http://www.iasoybeans.com/isa/cemsa.html) and the Lodi, California wine grape growers (http://www.lodiwine.com). In the state environmental policy sector, EMS innovations and trials are underway as well. Utah State University Extension has a program to integrate voluntary environmental management systems (EMS) into Utah's Animal Feeding Operations (AFO) strategy (Harrison, 2002). In Australia, several initiatives are underway to address environmental management and accountability through EMS adoption in the cotton industry and with livestock production (Mech and Young, 2001). The Environmental Management Systems Incentives Program offers "primary producers" financial incentives through a cost share program to implement changes on their operations that should positively impact the environment.

WHAT *IS* AN "ENVIRONMENTAL MANAGEMENT SYSTEM"?

The Environmental Management System is a systematic, voluntary and flexible strategy for identifying and managing environmental aspects of any operation. The ISO standards provide criteria designed to enable an organization of any size or type to manage the impacts of its activities, products and services on the environment. The fact that this standard was designed for any size and type of organization makes it potentially as relevant in agriculture as in any other industry. In agriculture, existing environmental farm plans and permits (such as CNMP, and conservation, odor, manure marketing, manure storage and nutrient plans) provide a foundation for an EMS. The EMS adds a policy defining the operation's environmental aspirations, forms and procedures for plan implementation, documentation of plan implementation, and annual review and improvement of the performance gained from the plan. This continuous *"Plan-Do-Check-Act"* cycle examines a production system from start to finish, from inputs to products. It provides a framework for making continual improvements, meeting regulatory requirements and demonstrating good environmental stewardship.

In a general sense, an EMS is a system that looks at an entire business or operation, evaluates every aspect of the operation, identifies strengths and weaknesses and then guides users to create a plan to address problem areas and to inevitably reduce pollutant releases from the operation. As environmental regulations become more stringent and more costly to implement, EMS's provide a way to document compliance and stewardship while minimizing the costs associated with

compliance. Many companies believe that these systems can also improve their efficiency which should lower costs for the company and increase profits. EMS's also allow these process changes and compliance decisions to be made without interference from an outside agency. They allow for a pro-active approach to improving policy and allow users to develop plans that suit their production needs and resources.

While there is growing support for EMSs, there are also a number of complaints and criticisms. The leading concern is that costs associated with the implementation of EMSs can still be inordinately high; in industrial applications, consultants and auditors are typically used at considerable expense. EMSs have also been criticized for being "skeletons with no flesh" (Ehrenfeld, 2001). Since the decision making power is often left in the hands of those responsible for the organization, they can be used to portray the image of improvement while maintaining the status quo. There is also a significant labor demand associated with creating and maintaining an EMS. These systems are not a stagnant body that can be reviewed every few years. EMSs are a living body that requires continuous monitoring, updating and reviewing to see effective change and progress. Often, an individual or small group is assigned the task of designing and maintaining an EMS. Initially progress is made, but over time the process becomes daunting and too time consuming to be maintained. This is a major reason why employee initiatives and incentives are key to an EMS's success. Few studies have documented environmental improvements obtained through EMS adoption but a review of the U.S. National EMS database shows that the introduction of an EMS can be somewhat beneficial to environmental performance and regulatory compliance (Andrews et al., 2003). Surveys of those that have implemented EMS's indicate that most firms and organizations believe that the benefits far outweigh the drawbacks (Darnall et al., 2001)

WHAT IS THE PROJECT'S PURPOSE?

Partnerships for Livestock Environmental Management Systems, is a 4-year project to explore the potential of agricultural Environmental Management Systems to help prevent non-point pollution and resolve community and regulatory concerns.

The project seeks to:

- Identify appropriate and valuable roles for livestock EMSs, and develop recommendations for successful EMS implementation in livestock and poultry production systems.
- Identify EMS design factors that influence credibility and likelihood of farmer investment, and develop tools targeted to producers and their coaches to guide EMS on-farm application.
- Identify policy options that could support successful implementation of livestock EMSs.
- Develop resources to support involvement of stakeholders in delivery of EMSs.

The project focus is on three major groups of livestock commodities: poultry, beef cattle, and dairy cattle. This is an experimental program of inventing, adapting, evaluating and comparing at least nine different approaches--in three distinctive states for each of the three commodity groups. Project participants have developed and pilot tested EMS development tools and delivery methods. In doing so, they have incorporated stakeholder input at both the State and National level. A complete project description is available at: www.uwex.edu/AgEMS/livestock.

METHODOLOGY

Participating states and methods are listed in Table 1. Initially, a national guidebook and a comprehensive set of livestock environmental performance assessment tools was created by project leaders and team members and provided for each state to use in adapting their own guidebook that would be state and commodity specific (Keolsch and Heemstra, 2004). This guidebook focused on development of a functional EMS. Based on collective knowledge of

their audience, project team members determined early that strict adherence to an ISO 14001 certifiable process would discourage farmers because of the scale of their operations and distinctive terminology. The state teams also sought to convey the EMS process as compatible with and adding value to producers' current environmental plans and operating procedures.

The project team reviewed the criteria required of an ISO certified EMS and selected key components they felt would be beneficial to a functional agricultural EMS. State project leaders were given flexibility in how they went about creating and using the national guidebook. Every state took a somewhat different approach to EMS delivery and addressing environmental issues in their region. By early 2002, the State Pilot Teams were planning their pilot testing procedures for their risk identification tools. Some chose to pilot test these environmental priority-setting tools independently of materials to support the other elements of a functional Environmental Management System. Others waited to test a complete "EMS Guidebook" till early 2003 and used the completed model EMS draft guidebook. The procedures carried out by each of the State Pilot Teams are described briefly in Table 1 and in more detail at the project website (www.uwex.edu/AgEMS/livestock).

Each State Pilot Team sought to:

- Build EMS understanding
- Provide for stakeholder input
- Limit EMS scope for start-up
- Focus on comprehensive assessments & action planning and/or "functional" EMS, and not an ISO 14001 certifiable system
- Integrate their pilot projects with existing efforts in their states to cultivate farmers' environmental management skills

Table 1: States involved in the LPEMS project and brief descriptions of the delivery methods used.

State	Delivery Method*	Lead Delivery Group*	Environmental Assessment	Farmers involved
GA: Poultry	Initial Large Group Meeting, Three approaches Self: Project tools Ext: Bi-weekly 2 hr mtgs. Cons: Full day on-farm meetings	Ext., Cons.	Producer given choice of multiple tools	23
VA: Poultry	Series of small group meetings at locations around the state	Ext.	State specific tool developed	41
PA: Poultry	Individual on-farm environmental assessments	Ag Commodity Group	State specific tool developed	30
ID: Dairy	Group meeting followed by individual on-farm meetings	Ext., SWCD	State specific tool developed	11
WI: Dairy	Individual on-farm meetings and one group meeting	Ext.	On-line and general tool developed	5
NY: Dairy	Worked with larger producers involved in quality management program	SWCD, Cons.	Existing state assessment tool	5
MT: Beef	Individual on-farm meetings	Ext.	State specific tool developed	26
IA: Beef	Large group and small group on-farm	Ext.	State specific tool developed	38
TX: Beef	Small group and individual farm visits	Ext.	Air Quality tool developed	6

* Abbreviations: Ext. is Extension, Cons. Is Consultant, SWCD is Soil and Water Conservation District Staff

PILOT TEAM EXPERIENCES

GEORGIA

In developing its pilot project for poultry growers, the Georgia project team relied heavily on the Georgia Poultry Federation, U.S. Poultry and Egg, the Georgia Department of Agriculture, and Gold Kist Farms for project support and recruitment of farmers. The Georgia Poultry EMS Pilot tested three different methods of developing EMSs on farms. Options included a self-guided procedure, an extension-specialist-led method and a consultant-conducted procedure. Two consulting firms worked with different farms to develop EMSs. Assessment tools used by producers in developing EMSs included the Environmental Management Solutions, LLC's On Farm Assessment and Environmental Review Program (OFAER), State and National Farm*A*Syst assessments, the Georgia poultry self assessment guide developed as part of this project, NRCS conservation planning resources, and farm family/employee brainstorming. Extension specialist-conducted and Farm*A*Syst assessments were the most popular choices. Few participating producers chose to use the independent self assessment tool developed for this project, although both consultants indicated that they used these tools in their EMS development process with farmers.

Key finding of the Georgia effort were:

- Farmers were very interested in developing a farm and family specific environmental policy. Growers made efforts to develop a statement regarding their efforts to produce a quality product while preventing pollution, striving for continual improvement and defining a stewardship ethic. Some saw benefits for themselves, and others recognized this was valuable for communicating with employees and communities.
- Growers indicated that the assessment process was beneficial. While most initially selected to use self assessment tools, many later requested third party assessments. Growers identified concerns on their own, including some not previously considered by the project team such as integrator mandates, dust and odor, emergency planning and noise pollution.
- Of the three groups, the self-led group had the greatest difficulty in understanding and creating an EMS; forty eight percent did not remain in the process. Results from the Extension-led group were quite satisfactory (17% drop-out) and participants were very involved in the process. The consultants' products were outstanding, although probably cost prohibitive on most farms unless multiple EMS's are developed simultaneously.

PENNSYLVANIA

PennAg Industries Association and Penn State University combined forces to develop an environmental assessment tool for the state's poultry industry, which includes broilers, turkeys and layers. With the assistance of a diverse and knowledgeable stakeholder group the team tailored and evaluated an environmental assessment tools for poultry growers. This tool evaluated potential water quality, odor and other environmental impacts from poultry operations and identified specific actions to reduce those potential impacts. The team identified ten cooperating producers from each of the broiler, turkey, and layer industries to test the ability of the assessment tools to serve different poultry enterprises. Project staff visited each participating poultry operation to conduct individual on-farm assessments followed by a written evaluation pointing out low risk areas and opportunities for improvement. Key findings, identified through surveys and producer comments, were that 75% of the producers indicated a preference for 3rd party assessment to a self-assessment. Additionally, 33% indicated that they were interested in pursuing an EMS to address needs identified by the assessment process, and that having an assessment tool that was concise and timely was critical to project success. The assessments revealed that many producers lacked plans for emergencies or biosecurity issues and found that many producers plan to make changes to their operations based on the information they received from their assessment and evaluation.

VIRGINIA

The goal of the Virginia Environmental Management Systems Pilot Project was to determine how an EMS could be used in a heavily regulated environment. A diverse advisory committee of producer, industry, regulator, and academic interests designed the EMS materials, which included a 15-page Virginia Poultry EMS Guidebook and assessment tools, to allow farmers to conduct "self-assessments" and complete their EMS at their convenience, eliminating confidentiality concerns. Growers were identified through the five poultry integrators in Virginia to attend EMS workshops. Growers invited to the workshop by their integrator were much more likely to attend than those contacted directly by project personnel. Materials were introduced at a half-day workshop, during which producers were led through the Virginia EMS. The 41 participating producers were then sent home with materials. Project personnel followed up with phone calls to discuss EMS development. While most of the producers participating in the project felt the EMS program was admirable in its intent, concern was raised about the amount of time required for record keeping and paperwork. Many of the producers were still struggling to comply with the newly adopted Poultry Permit requirements, and viewed the EMS as an unnecessary exercise. The poultry producers who were most receptive to the project were the environmental leaders within the industry who were already recognized for their environmental stewardship. More tangible incentives, including cost-share money, must be found to encourage not only the environmental leaders of the industry but also those struggling with economic performance issues. Finally, company owned farms required more guidance in developing an EMS than privately owned farms since these farm managers felt they needed corporate approval on items like priority issues and the environmental policy statement. Future efforts should focus on collaborating with integrator companies early to obtain the benefit of their close working relationships with individual poultry growers.

MONTANA

The Montana pilot project worked with ranchers to assess facilities related to beef cattle ranching such as corrals, winter feeding grounds, back-grounding lots (where calves are fed to a target weight prior to shipping), and calving areas. A multi-agency/producer oversight committee recommended a self-assessment approach for beef producers. A 14-page environmental risk self-assessment tool, specific for Montana small and mid-sized beef producers was developed and pilot tested on 23 ranches across Montana as well as on 3 research farms. The project held 25 AFO/CAFO awareness workshops and gave 7 presentations to commodity groups introducing them to the concept of EMS. The presentations covered four levels of EMS development, from a basic environmental assessment up to requirements for ISO 14000 certification. To date, one complete EMS has been developed. Producer impacts originating from the Montana project are exemplified by one producer who diverted all surface water away from his back-grounding lot, installed gravity flow watering systems to the lot, and made his pens half their original size. These management changes eliminated clean water run-in across the lot, and have allowed for a filter area for lot runoff.

IOWA

The Iowa Beef Center developed an assessment tool for non-permitted feedlots (under 1000 head) as a pilot project. It was tested for consistency of results by multiple teams of extension staff on a single feedlot. A draft of that assessment tool was also used at 12 field days with beef and dairy cattle producers. The field days focused on management strategies as well as design of open feedlots and manure management structures. The pilot project also scheduled a multi-agency (NRCS, DNR, and Extension) training in feedlot assessment and environmental management and is in the process of developing an EMS for the Iowa State University Beef Nutrition Farm. Iowa beef producers were invited by Iowa State University Extension Livestock Field Specialists to attend information and training sessions on EMS. Thirty-eight producers representing 35 operations attended four 2-part workshops in March and April, 2003 and follow up sessions were held on-farm with individuals or in small group meetings. Participants were surveyed in November, 2003 on their progress and attitude toward their EMS. Ninety percent of

the participants responding plan to continue working on their EMS. Two-thirds regularly refer to their policy statement for direction and most have shared it with others inside and outside of their operations. Approximately 75 percent have developed written action plans for priority issues and are following these plans to reach their objective. A large majority of the participants sought professional advice and have made changes to improve their physical plant, management practices, and documentation as it relates to environmental performance of their feedlot because of this program.

Key findings from this effort include the following:

- One-on-one or small group on-farm education is essential. Initial large group meetings were effective in introducing the program, however individual on-site consulting proved to yield greater results regarding the producers' operations.
- Producers will customize printed materials to fit their farm, but need an effective framework to start from.
- Documentation tools must be kept as concise and simple as possible.
- Producers under the more regulatory pressure were most interested and cooperative. These were the ones that could see an immediate pay-off from EMS. Unregulated producers appreciated the program, but not the paper work.
- Producers have a strong stewardship principle and the policy statement helps them quantify and implement these principles and share their views with others.

TEXAS

Cattle feedyards in Texas are already highly regulated under both a federal CAFO permit system and state CAFO rules. Industry stakeholders were skeptical of an EMS program that they saw as duplicating much of the technical content and record keeping required of their existing permit structure. These concerns suggested the need for a more targeted, non-duplicative program to address a clearly stated need on the part of the cattle-feeding industry: air quality management. They established the "Feedyard Air Quality Management Program" to work with a stakeholder/producer group including the Texas Cattle Feeders Association and six cattle-feeding corporations representing over 25 cattle feedyards. The project team has focused squarely on air pollution and its implications for nuisance conditions, regulatory compliance, public relations and human and animal health. The cattle feeding industry needs to be able (a) to monitor dust and odor conditions quickly, easily and cheaply and (b) to implement a suite of management practices or technologies to reduce the frequency, duration and/or severity of air-pollution events. Unfortunately, current air-monitoring techniques are prohibitively expensive, technically demanding and impractical. The Texas pilot team developed a new, color-based, visibility measure to provide feedyards with a cheap, rapid and simple means of detecting and measuring dust conditions. The visibility models are part of an air quality toolkit that feedyard managers can use to assess their air-pollution risks, identify mitigation strategies and measure and document improvements. Their risk-assessment toolkit also includes a risk "matrix" that asks cattle feeders and their neighbors to identify the air quality factors (such as dust, odor, visibility, ammonia etc.) that are likely to be most important to them and then specify what motivates them to be concerned about those factors (neighbor nuisance, first impressions, regulatory pressure, human health, livestock performance etc.). The project has illuminated concerns other than dust and odor that the cattle-feeding industry will face in the near future. The incentive to implement an EMS or air quality management program is the performance benefit that will reduce regulatory exposure, improve neighbor relations, prevent severe nuisance conditions, limit liability and control the costs of air-quality protection.

NEW YORK

As early as 1996, PRO-DAIRY, a statewide program of Cornell University that promotes farm management skills, focused its efforts on the agricultural environmental problems. An Agricultural Environmental Management (AEM) system was designed with the involvement of

all the federal and state programs as well as private entities. New York's AEM consists of 5 tiers: Tier I: Information gathering, Tier II: Environmental Assessment, Tier III: Planning and Design, Tier IV: Implementation, and Tier V: Evaluation. These tiers relate to NRCS's 9-step planning process. Today over 6,000 farms in New York have started the AEM process by assessing their farms and over 1,000 farms have made changes in their operations. One of the lessons learned from these experiences was that farmers need additional management skills to implement change and improve performance in targeted areas of production. This project designed a functional EMS framework to streamline the EMS process and get results quicker with less cumbersome documentation. The project also developed six Assessment Worksheets for dairy operations. On five dairy farms, producers worked with an educator to pilot the functional EMS framework, using the EMS guidebook developed by the National project team. All five farms had a CAFO plan created by a certified planner, and each one wanted to include their certified CAFO planner in the process, recognizing that the additional tactical planning, checking and evaluation were missing in the CAFO permit process. The farm managers used "tactical planning" worksheets that identified tasks to be accomplished, assigned responsibility, set timelines, gave conditions of quality, and checked for completion. The tactical planning worksheet translated decisions into actions for the farm. This process was much like the original PRO-DAIRY management process, except that it was focused on environmental improvement.

Other key findings were that:

- The EMS process took a minimum of 16 hours with each farm.
- Producers found the policy statement process very useful for focusing their ideas.
- Farmers' motivations for pursuing an EMS included their visibility in the community, many employees in need of training, as well as a long-term interest in a sustainable business.
- According to Bill Cook, of Aurora Ridge Dairy, "EMS focuses our attention, our efforts, and achieves results on the environmental projects we need to implement in order to stay productive and be responsive to the needs of our neighbors. The process helps to bring about the needed changes we were thinking about. "

WISCONSIN

The WI Dairy EMS pilot project brought together a diverse stakeholder workgroup of agricultural and environmental interests to facilitate the development and promotion of Dairy EMS. Project staff conducted meetings and workshops to describe the EMS concept, and to solicit collaboration in developing and pilot testing materials. Using feedback from the stakeholder group, the Wisconsin Dairy EMS Guidebook and worksheet templates were developed to be a complete self-directed guide for any farmer, owner, manager, educator or consultant who wants to incorporate environmental management into the daily operation and long-term planning of a farm business. The Dairy EMS guidebook was tested on three large dairies in west-central WI and on two UW Agricultural Research Stations. Project staff are also collaborating with the insurance industry on liability insurance premium reductions based on the EMS process. Project staff encountered confusion about the number of other assessment, planning and quality assurance programs being used – such as Farm*A*Syst, the On-Farm Assessment and Environmental Review Project (OFAER), and the Wisconsin Professional Dairy Producers' Dairy Quality Assessment (DQA). The perception that an EMS is just another planning process hinders increased EMS adoption. A unique finding of the Wisconsin group was that, by working with private sector insurance agents, environmental protection can be institutionalized into farm management without public sector assistance. The other benefits of the EMS process were not immediately apparent to farmers, and a strong educational and advisor presence will be required to motivate farmers and to facilitate the EMS process. However, based on project work, farmers and custom manure haulers have received reductions in their insurance premiums, ranging from 10 to 21%. They also found that technical advisors were often more

concerned about protecting farmer confidentiality than were farmers themselves; indicating that confidentiality may not be an insurmountable stumbling block for EMS.

IDAHO

The Idaho Livestock Environmental Management System pilot project was designed to give small and mid-size regulated dairy producers an opportunity to learn about, and complete, a condensed EMS guidebook in a single day. The Idaho pilot test focused on eleven dairies of 65 to 1000 milk cows in the Fifteen Mile Creek Watershed, which is implementing TMDL requirements. The pilot team introduced producers to EMS as: "a business management system that helps you develop your own strategy for integrating environmental considerations into production decisions." The team developed a 12-page condensed self-guided workbook and a 25-page self-guided reference guidebook, tailored for Idaho dairy producers. These materials were pre-tested with 12 Idaho stakeholders representing a variety of private and public groups. Team members met individually with producers at NRCS field offices and introduced them to the concept and process of EMS. In evaluating the project, the Idaho team analyzed depth interview and evaluation data gathered from stakeholders and dairy producers. The team identified ten farmer adoption decision factors, including 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. Survey results indicated that producers liked the EMS approach as it helped them identify problems and made them more aware of environmental issues. Producers said that the opportunity to revise their EMS plan was a strong advantage; they dislike any plan that locks in future behavior. The potential of EMS to reduce environmental liability drew strong positive statements, and could be the primary specific cause for adoption of an EMS by this group.

The EMS approach is seen as particularly advantageous as a public relations tool and as a potential environmental liability protection document. Observable successes of EMSs at the producer level are not available and this factor limits adoption. Idaho Pilot results suggest that a self-directed approach, with self-explanatory materials, does not offer sufficient depth of understanding to demonstrate the advantages of an EMS to small and mid-size producers. Also, once a target public is fully regulated, there is little incentive for them to take a serious look at a management system that does not offer financial reward. These two conclusions suggest the need for a revised EMS approach for the small and regulated farmer.

DISCUSSION

In addition to the above findings, pre and post surveys were used to assess producer opinion and project success, results from these surveys are currently being analyzed and will be presented in future papers. The discussion and conclusions drawn below come from State final reports, preliminary analysis of the survey data, and discussions conducted at National team meetings.

What Motivates Producer Interest in EMS Development and Implementation?

- One of the main findings of the project was that EMS is not for everybody. Those with larger or more complex agricultural systems, those with more employees or complexity of communications, or those that have had public relations or compliance issues in the past are more likely to accept and use an EMS.
- Farmers that understand and enjoy the management challenges, like working with data and people, and who understand how management impacts productivity are more likely to benefit from an EMS. Many farmers are not well suited for management and would rather be with their livestock or on their tractor; they farm to avoid management and will resist EMS adoption.
- Producers have to want to be environmentally proactive (or see significant profitability advantage) to be willing to commit themselves to the EMS process.

- Motivators to get them started will be different than those that motivate them to continue. Incentives may be more important as an initial motivator, while the benefits that emerge from the process are the sustaining motivators.
- Environmental improvements are not a primary motivator. Most producers believe they are good stewards, feel good about what they're doing, and are proud of their farms. To sell EMS's producers do not want to know what they're doing wrong, but what they can do better. We need to stress the *management* rather than the *environmental*.

Does the EMS Framework Prove Worthwhile for Owner-Operated Farm Operations?

- Our survey results consistently indicated that producers participating in the pilot studies agreed that, "Environmental Management Systems aid in improving overall farm management."
- Farmers placed the most value on the policy statement and assessment portions of EMS development. Many took pride in their policy statement and view the documentation of the farm's goals and values as beneficial to them. They also viewed the assessments as critical to helping them identify and correct problems.
- Time, record keeping requirements, and resources are considered the biggest impediments to EMS adoption by producers. Many producers would not invest the time, energy or knowledge to implement an environmental management system without substantial coaching. Conversely, those that did invest the time, cited compliance, record keeping, and savings in resources as benefits to EMS development. There is a need to invest to get this return.
- The fit between EMS & other planning processes causes producer confusion. A farmer needs to understand the differences between a management system and required records and plans.
- EMS requires producer ownership and this is a difficult concept for some producers to grasp. Many initially view it as another planning process that someone will do for them.
- An EMS can pay financial dividends such as reduced liability insurance premiums, and peace of mind dividends in lending greater predictability and security to relations with regulators, but currently external incentives are limited.
- Developing and implementing an EMS can greatly enhance and ease communications and improve image with neighbors and community.

Can the EMS Framework Help Us Achieve Improved Environmental Quality?

- The majority of producers plan to implement changes in their environmental management as a result of their participation with the pilot projects.
- Participating pilot farmers agreed that, "Implementation of EMS would significantly reduce negative environmental impacts from livestock operations."
- The EMS helps farmers to take ownership in and implement their nutrient management or conservation plans. Many producers involved in the pilot projects saw new value in their previous planning efforts.
- EMS procedures and action reviews help avoid or mitigate accidents or disasters.
- An environmental management *system* takes farm environmental performance well beyond individual Best Management Practices and requires continuous improvements.
- Beyond these findings, our project is limited in its ability to document actual environmental quality improvements from livestock EMSs.

What Have We Learned about How to Coach EMS Development and Implementation?

- Risk assessments in themselves do not constitute an environmental management system. Nor is EMS redundant with various conservation plans required of farmers.
- Tools must recognize time limitations, especially of small & medium sized operations.
- Tools need to bridge the gap between ISO 14001 and the producer's world. They need to speak farmers' language.
- Effective delivery requires commitment and appreciation of the value added from EMS on the part of the educator.
- An EMS can support and assist farmers with regulatory compliance best if it precedes compliance deadlines. Otherwise it appears like "extra work" to farmers weary of environmental requirements.
- An outside individual, or coach, is needed to initiate the process and continuing motivating the producer. Individual, one-on-one coaching is most effective, but classes with regular follow-up contact can be effective as well. Providing materials with instructions to producers to use them on their own is far less effective than leading them through the process.
- There are various worthwhile assessment tool options available. While producers indicated an initial preference for self assessment tools, they saw more value in third party assessments.
- The process experienced was more important than the endpoint or document produced. Many producers want to see an EMS and know how long it will take to create it. Few understand that it is a process and not a product. It creates a dynamic document and a better way of doing business.

CONCLUSIONS

Introducing an EMS approach consistent with the ISO 14001 model to agricultural operations in the current context runs into numerous and considerable forms of resistance. An EMS educational program encounters a steep learning curve among producers and among educators since the process orientation and the needed farmer ownership are sufficiently different from prior BMP-based educational efforts at changing farmer environmental practice. This project brought many of these forms of resistance to light, and made considerable progress in learning how to overcome or circumvent those barriers. The project found that Environmental Management Systems can address many different concerns. They can improve producer management skills and provide producers with a framework to grapple with and substantively address neighbor and environmental stakeholder concerns in a non-threatening context. They yield records producers can use to demonstrate their environmental performance and compliance with regulations. They meet watershed managers' and agency needs for a consistent framework through which producers accept responsibility and behave proactively in reducing non-point pollution threats. They meet insurers' and bankers' needs for reduced environmental liability. Participants in the *Partnerships for Livestock Environmental Management Systems* project indicated that, overall, the project was applicable to their operations and that this system of management could be used in conjunction with other management plans already in place. Producers also felt that the paperwork and the amount of time necessary to complete an EMS would definitely inhibit the creation and use of an EMS, but that those that invested the time, could derive considerable benefits from this investment. A key finding of the project was that the EMS process will probably not work for everyone and that they must be proactively adopted by those that willing to invest in environmental improvement. Environmental Management Systems are a more comprehensive approach that encourages the producer to take ownership of the issue and work on improving himself. To encourage greater adoption and knowledge of

EMS's in agriculture, investments are needed to educate technical assistance providers or "EMS coaches" and to educate the agricultural community on the benefits of the EMS approach.

ACKNOWLEDGEMENTS

The authors would like to thank the many dairy, beef and poultry producers who made the pilot tests a reality, the many state and national stakeholders who assisted the project, and the federal agencies that made the project possible. The project was funded through a USDA Initiative for Future Agriculture and Food Systems (IFAFS) Grant, and additionally supported by the Environmental Protection Agency Non-Point Source Control Branch, and the USDA Natural Resources Conservation Service.

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