Introduction

The Michigan Groundwater Stewardship Program (MGSP) was initiated in 1993 with the signing of Public Law 247 by her governor, John Engler. The mission of MGSP is to provide information and assessment tools for pesticide and nitrogen fertilizer users which help them identify risks to groundwater associated with their pesticide and nitrogen fertilizer use practices, and to coordinate local, state, and federal resources to help individuals reduce those risks. The Program is designed to be voluntary, to be locally driven, to address concerns of individuals, and to maintain a focus on the financial and technical constraints which drive real-world decisions. MGSP is relatively narrow in focus addressing only risks to groundwater associated with agrochemical and fertilizer use. However, it has a wide scope and addresses the many uses of these inputs in agriculture, turf grass, and rural and urban households.

Local program direction is determined by Groundwater Stewardship Teams, which decide the mixture between cost-share, technical assistance, and/or demonstration provided by the program. They ensure coordination of local resources, and make sure programs meet the groundwater protection needs of agrochemical and fertilizer users. The local Groundwater Stewardship Programs are being funded through a competitive grant program. Technical assistance personnel are hired to help individuals complete an on-site evaluation of risks and help implement practices that reduce those risks. Local programs generally have four components of which Farm*A*Syst is one.

Objective of the Study

Farm*A*Syst (Farmstead Assessment System) is a voluntary assessment tool designed to evaluate potential risks to groundwater posed by farmstead practices and structures. It consists of a series of fact sheets to help raise awareness of groundwater issues and alternative practices, and worksheets to help landowners rank on-site risks. Rankings from these evaluations are then used to summarize the assessment, and identify voluntary action that can be taken to protect groundwater at that site. All the information from the assessment stays with the farmer, who can then decide if he wants to pursue voluntary actions that would lower his risk to groundwater.

Michigan Groundwater Stewardship Program conducts formative and summative evaluations of
the Farm*A*Syst program. The objective of the formative evaluation is to determine the programs’ usefulness, suggest possible improvements in fact sheets and worksheets, and provide guidance to future education and research efforts.

The objective of this paper is to share on the findings of the first year of evaluation results. It will provide an example of how the continuous monitoring can be used to improve the content, relevance and delivery of extension education programs.

Methods and Procedures:

Michigan Groundwater Stewardship Program supports Farm*A*Syst evaluation. The program has developed an evaluation tool to assess the Farm*A*Syst program. Each farmer who has conducted a farm assessment is asked to fill out and return a short survey to evaluate the Farm*A*Syst program. The survey instrument, entitled Farm*A*Syst Evaluation and Stewardship Practice Survey, was designed with the collaboration of the AEE Center for Evaluative Studies, Department of Agricultural and Extension Education, Michigan State University. The surveys are distributed to participating farmers through local groundwater technicians.

As of September 15, 1997, completed surveys were received from 484 respondents, or about 30% of the planned number of Farm*A*Syst’s for this fiscal year. The survey responses were tabulated and analyzed using the Statistical Package for the Social Sciences (SPSS PC+) software. Frequency counts, means, and standard deviations were used to analyze the data.

Major Findings:

1. **Who was Farm*A*Syst Technician in Michigan?** The respondents to the survey represented 66 Michigan counties. More than three-quarters (79%) of the respondents reported that their Farm*A*Syst technician was a Soil and Water Conservation District (SWCD) Groundwater Technician, while 11% were assisted by a USDA AmeriCorps member. Four percent reported that they were assisted by a MSU Extension agent, and an equal percentage stated they did not know the profession of their Farm*A*Syst technician. Other types of technicians involved in Farm*A*Syst included crop advisors, IPM scouts, crop contractor, and NRCS agents.

   Respondents generally agreed or strongly agreed to the various statements on the knowledge and effectiveness of the groundwater technician. On a scale of 1 to 5, the mean rating for most of the statements ranged between 4.09 and 4.51.

2. **How do farmers view about the current Farm*A*Syst materials?** The respondents were asked to provide an evaluation of the current Farm*A*Syst materials to identify areas needing improvement, or to suggest new risk assessment tools to be developed and added in the future to the Farm*A*Syst package.

   Slightly more than half the respondents (50.9%) read the fact sheets in the Farm*A*Syst
while they completed the worksheets. Twenty three percent reported that they read the fact sheets after completing the worksheets, while 14% read them before completing the worksheets. Eleven percent of the respondents said that they had not yet read the fact sheets.

Findings indicated that all respondents did not complete all sections of the Farm*A*Syst materials. For example, between one-third and one half of the respondents did not complete the sections dealing with livestock waste storage, livestock yard management, silage storage and milking center wastewater. Similarly, about 10% of respondents indicated that they did not complete the section on fertilizer storage and handling.

The sections on drinking water wells, pesticide storage and handling and petroleum products storage were considered the most useful. The mean ratings for these sections were 4.6, 4.5, 4.4 and 4.3, respectively, on a scale of 1=complete waste of time to 5=very useful. Fertilizer storage and handling, soils and geology and hazardous waste management were considered somewhat useful with mean scores of 4.3, 4.3, and 4.1, respectively. The sections on household waste water, livestock waste storage, livestock yard management, silage storage and milking center waste water were found less useful in comparison to the other sections; the mean ratings for these sections varied from 3.8 (silage storage) to 4.0 (household waste water, livestock waste storage and livestock yard management). Although one-third to one-half the respondents did not complete the livestock sections, those who did complete them found these sections only “somewhat” useful.

3. What new materials need to be added in the Farm*A*Syst? The survey sought responses on whether respondents were interested in seeing development of new materials that dealt with in-field and crop specific topics based on Farm*A*Syst. Most respondents indicated interest in new materials on emergency and spill preparedness, in-field pesticide and fertilizer management, and corn production.

4. What are the topics for research and demonstration of interest to farmers? The Michigan Groundwater Stewardship Program has been supporting research and demonstration activities that reduce individuals’ risk of groundwater problems. The survey sought to identify general topics of interest that could be included in the program’s research and demonstration activities.

The topics of greatest interest to farmers for research and demonstration activities are soil testing and management (pre-side dress nitrogen, manure N content, yield goals), and integrated pest management (pest thresholds, crop scouting, etc.). Topics of intermediate interest are structural practices (portable pad use, temporary storage etc.), equipment calibration, and economics/record keeping. Irrigation water management and intensive rotational grazing are of low interest.

A majority of the respondents (59%) are of the opinion that local, on-farm research and demonstrations would be the most useful to them. On-campus and regional research
facilities received a lower preference, selected by 13% and 9% of the respondents, respectively. Some respondents indicated a combination of local, regional and/or on-campus research and demonstration activities, but these were very few.

5. **What are preferred information dissemination media?** The most preferred methods to receive information generated by research/demonstration activities are, in order of importance, newsletters (84% of respondents), field days (72%), and local meetings (65%) (see Table 10). Few respondents (8%) indicated wanting to receive information through the Internet, which may be an indication of the low penetration of this media among farmers.

6. **What practices need to be considered for technical assistance and cost-share?** After having completed a Farm*A*Syst evaluation, the respondents were asked to identify practices they would like MGSP to support with technical assistance and/or cost-share. A comprehensive list of potential practices was provided in the survey out of which respondents were asked to select the five they believed were most important to them. The list of practices and frequency of responses shows that fuel storage remains the most popular practice to be considered for technical assistance and cost-share from MGSP, preferred by 55% of respondents. Other practices suggested were field scouting for insects, disease, or weeds (46%); pre-side dress soil nitrogen testing (40%); short term (32%) and permanent (29%) pesticide storage; and pesticide sprayer calibration (29%). Practices that were not popular included intensive rotational grazing, spray injection systems and irrigation scheduling, mentioned by 12%, 10% and 9% of the respondents, respectively.

**Conclusions and recommendations**

In spite of a low participation of farmers having completed a Farm*A*Syst in the evaluation survey of the program (roughly, about 7% has completed and returned the instrument), the program is considered useful by the majority of farmers. This is confirmed by the written comments respondents made at the end of the survey instrument. The fact that they can earn pesticide applicator re certification credits if they have completed a Farm*A*Syst may be an added incentive contributing to the positive evaluation of the program; four-fifth of those who are certified applicators indicated that they applied for re certification credits.

The technicians delivering the program are considered to be knowledgeable about groundwater and agriculture, timely and professional, and helpful in delivering and explaining information. There is room for improvement in some of these areas among different technicians delivering the program, most notably the group of crop advisors. It is recommended that the MGSP organizes and develops a special training program for this group aimed at reducing specific deficiencies in their perceived performance.

In general, respondents rated all categories of technicians delivering Farm*A*Syst lower on the question ‘Gave me useful information on local demonstration projects.’ An effort should be made at the next kick-off meeting to discuss this item, and find ways of improving performance.
in this area.

Except for the livestock related sections and the section on household wastewater, the Farm*A*Syst materials were considered useful to be very useful to the respondents. Livestock related sections were completed by only one-third to slightly more than one-half of respondents, presumably because the majority of farm operations in Michigan do not include livestock. However, in addition, the materials were rated only somewhat useful by those respondents who did complete these sections. These figures are an indication that improvements in these sections are warranted. We maintain our recommendation that the respective sections are reviewed by a committee consisting of MSU extension specialists, MGSP representatives, and livestock producers organizations to increase their relevance and usefulness to livestock operators.

Respondents indicated that they are interested in new materials on in-field and crop specific practices based on Farm*A*Syst. Materials showing the greatest interest were those dealing with emergency and spill preparedness, in-field pesticide and fertilizer management, and corn production. The Field*A*Syst materials being developed will address the areas of in-field pesticide and nutrient management, while a new section on emergency preparedness has already been added to the Farm*A*Syst package. Other areas attracted less interest overall, but may be of importance to select groups of farmers. Development of the latter should, therefore, not be ignored, but can be assigned a lower priority.

Research and demonstration topics of greatest interest to farmers include soil testing and management and integrated pest management. They prefer that such research and demonstrations be carried out locally on-farm, and that their results are shared through, in order of importance, newsletters, field days, and local meetings.

Lastly, respondents indicated that fuel storage; field scouting for pests, diseases and weeds; pre-side dress soil nitrogen testing; temporary and permanent pesticide storage structures; and pesticide sprayer calibration should be considered priority areas (in the above order of importance) for technical assistance and possible cost-share.

References: