



Minnesota Department Of Agriculture

Pesticide Management Plan Status Report

2006

I. Introduction

The Pesticide Control Law (Minn. Stat. §18B.045) required the development of a state Pesticide Management Plan (PMP) to prevent, evaluate and mitigate occurrences of pesticides or pesticide breakdown products in groundwaters and surface waters. The law also directs the Minnesota Department of Agriculture (MDA) to submit a biennial status report on the plan. The following is the biennial status report, which outlines accomplishments and major activities conducted during 2003 and 2004 in support of the PMP.

The statutory requirements and purpose for the PMP are outlined in the enabling legislation (18B.045):

“The commissioner shall develop a pesticide management plan for the prevention, evaluation, and mitigation of occurrences of pesticides or pesticide breakdown products in groundwaters and surface waters of the state. The pesticide management plan must include components promoting prevention, developing appropriate responses to the detection of pesticides or pesticide breakdown products in groundwater and surface waters, and providing responses to reduce or eliminate continued pesticide movement to groundwater and surface water.”

Development of the PMP began in 1990, with a final draft published in 1996. Minor revisions were made in 1998. The United States Environmental Protection Agency (EPA) provided a formal concurrence with the original 1996 version and with the revised 1998 version. While the PMP is required by statute, it is a guidance document and has no enforceable or regulatory requirements. The PMP and additional data on many of the activities discussed in this report are available on the Minnesota Department of Agriculture (MDA) website at <http://www.mda.state.mn.us/appd/ace/pmp.htm>

The MDA completed a revision of the PMP in June 2005. Revisions to the 1998 PMP included:

1. A review of the multiple processes and actions outlined in the PMP in relationship to available resources; and
2. Development of streamlined processes and greater precision and consistency in the PMP’s reference to relevant statutes.

Additionally, some of the information in the 1998 PMP, and many of the references, were no longer current or completely accurate, and some of the process steps were intended to comply with previously anticipated requirements of the U.S. Environmental Protection Agency and were not necessary or efficient for the unique needs and conditions in Minnesota.

While the PMP was being revised, the MDA deviated from some of the processes and activities outlined in the 1998 PMP until the formal revision process was complete. The previous committee process for determining commonly detected pesticides in ground water and evaluating impacts from pesticides to surface water was suspended, and a reconfigured committee, the Pesticide Management Plan Committee (PMPC), was established and held its first meeting in

July 2006. Also, the requirements for establishment of unique teams to manage the development and evaluate the effectiveness of pesticide-specific best management practices was abandoned in favor of integrating all MDA BMP evaluation activities with the PMPC, and establishing a BMP Education & Promotion Team to focus on promotion and education.

Information about the PMP revision process, including a copy of the June 2005 PMP and the outcomes of the issues forum and public meetings are available from the MDA website at <http://www.mda.state.mn.us/appd/ace/pmp.htm>

In February 2006, in response to a directive from Minnesota's Legislative Audit Commission to evaluate pesticide regulation in Minnesota, the Office of the Legislative Auditor's Program Evaluation Division completed a comprehensive review of MDA pesticide programs and published its report, "Evaluation Report: Pesticide Regulation." One recommendation of the report was that "The Department of Agriculture should revise the Minnesota Pesticide Management Plan to better address issues of urban pesticide use, aquatic pesticides and product registration." The basis for the recommendation is provided on pp. 77-79 of the Legislative Auditor's report. Another recommendation of the report was that "The [MDA] should immediately develop and carry out a plan for evaluating the implementation and effectiveness of its best management practices." The basis for the recommendation is provided on p. 99 of the report. The MDA commissioner accepted these recommendations.

Consequently, the PMP will undergo additional revision. Proposed revisions are currently being drafted. A draft revised PMP will eventually be released for public comment. The next PMP Status Report will provide additional detail about new PMP revisions. A BMP implementation and effectiveness evaluation plan is also under current development, and the next Status Report will include references to the plan.

II. Prevention Activities

Promotion of Pesticide BMPs and Training of Applicators

In February 2004, the MDA published Best Management Practices (BMPs) that focus on the use of all agricultural herbicides, and includes specific practice recommendations for five herbicides of concern for water resources. These BMPs were developed, in part, in direct response to MDA's mandates under the state Groundwater Protection Act (Minn. Stat. 103H). Additionally, the BMPs address surface water concerns in an effort to either reduce or eliminate losses of herbicides to lakes, rivers and streams, and also to avoid possible impairment declarations for specific water bodies under the Clean Water Act. The herbicide BMPs and the previously published BMPs for general pesticide distribution, storage, handling, use and disposal, together with use inspections and MDA's participation in pesticide applicator training, form the foundation of MDA's prevention efforts. These efforts are further summarized as follows:

MDA/University of Minnesota Extension Service and Dealer-Sponsored Applicator Training

The MDA works cooperatively with the University of Minnesota Extension Service (UMES) and other interested parties in training pesticide applicators. Certification or licensing of applicators requires continuing education. These annual training sessions are

vehicles for the promotion of proper pesticide handling, storage and use, and help minimize the potential risk from inappropriate management and use of pesticides. Newly published BMPs have been incorporated into recently revised applicator training manuals.

General Promotional Activities

In 1998, the MDA completed development of BMPs for general pesticide distribution, storage, handling, use and disposal. These BMPs continue to be promoted by cooperators, through MDA's pesticide applicator training programs, and periodically by inclusion in the quarterly MDA newsletter, the MDA Update, which is sent to commercial/non-commercial pesticide applicators and private/restricted use pesticide applicators. Copies of the herbicide-specific BMPs have been sent to all 92 Soil Water Conservation District offices and UMES Regional Extension Educators that focus on crop production. BMP promotion has been integrated into Soil & Water Conservation District regional update meetings, Certified Crop Advisor continuing education programs, annual dealer meetings and industry pesticide updates. Other promotional opportunities are constantly being accessed and pursued.

Regionally-specific Promotional Activities

In 2005, southeastern Minnesota was targeted for specific BMP promotion due to the vulnerability of water resources in the limestone-karst areas where thin topsoil, sinkholes and rolling topography combine to threaten water resources with agricultural runoff containing nutrients, sediment and pesticides. Agricultural chemical dealers were directly interviewed about their pesticide recommendations, application practices and familiarity with the herbicide-specific BMPs and label requirements. Follow-up conversations and outreach have focused on water resource vulnerabilities to herbicides containing atrazine and acetochlor.

Newsletters, Articles and Presentations

The MDA submits articles on pesticide-related issues to publications that focus on agricultural audiences, and conducts presentations at meetings with ag producers and ag chemical dealers. Typically these focus on promotion of the herbicide BMPs, inclusion of BMPs in UMES on-farm record-keeping manuals made available to growers, and presentations to Certified Crop Advisors, Pesticide Applicator Training sessions, and various dealer and UMES "update" meetings addressing label changes and use practices.

Establish Education & Promotion Team

One of the elements of the revised PMP included establishment of an Education and Promotion Team (EPT) whose membership and purpose is designed to:

1. Provide assistance with the review and design of educational and promotional activities.
2. Promote Best Management Practices (BMPs) and provide education about how the use of BMPs will prevent, minimize, reduce, and eliminate sources of water resource degradation, including through demonstration projects.

3. Identify opportunities for cooperation among state agencies, representative EPT organizations, pesticide registrants and other interested parties, including opportunities for joint grant-writing.

The EPT is comprised of a core membership drawn from those agencies and organizations directed in Minn. Stat. §103H to participate in BMP promotion and demonstration. Additional members from any stakeholder group are welcome to participate. The core membership of the EPT met in October 2006 and additional meetings of the EPT are planned for early 2007. The EPT will meet at least once annually to plan and confer on BMP education and promotion opportunities.

Integrated Pest Management (IPM)

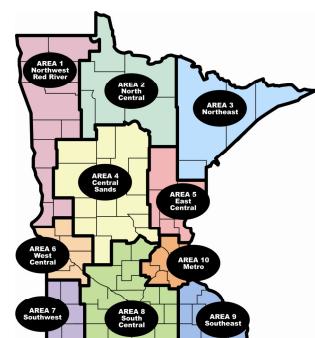
The MDA continues to provide leadership in developing non-chemical pest management methods through implementation of several programs in integrated pest management and integrated weed management. In addition, the MDA provides leadership and applied research assistance for the biological control of insect pests and weeds. These programs are coordinated and prioritized based on the current state of science and an understanding of where integrated management is currently feasible.

Urban Activities

In 2005-2006, the MDA continued efforts to inform grocers and markets of proper pest control and pesticide product sales in their establishments. Also, the MDA obtained funding from the Legislative Commissioner on Minnesota Resources to conduct outreach to urban pesticide users on the safe use of pesticides and alternatives through the Children's Pesticide Exposure Reduction Initiative. In addition to providing resources to families and communities on reducing exposure at home, there are related benefits to protection of the environment and water resources.

Pesticide Management Areas and Pesticide Monitoring Regions

The MDA received a grant from the EPA to develop the concept of pesticide management areas (PMAs) as outlined in the PMP. PMAs are areas of similar characteristics in which a BMP may be applied. The concept is useful for continued prevention and evaluation efforts associated with PMP implementation. The MDA continues these efforts using dedicated funding from the Pesticide Regulatory Account. Boundaries of the Pesticide Management Areas also serve to define the MDA's Pesticide Monitoring Regions (PMRs). The PMAs and PMRs have been used to compare leaching and runoff patterns within them. This comparison is helping to protect water resources in diverse agricultural areas of the state.



Additional Staff

In 2005 and 2006 the MDA hired several additional staff whose responsibilities include assistance with the promotion of water quality pesticide BMPs. Three water quality specialists were hired to complete a team of five that maintain local offices in different regions of the state. Additionally, a weed scientist was hired to focus only on BMP

promotion and evaluation, and a one-year unclassified position was hired to develop and implement a consistent approach to monitoring urban pesticide use. And an urban water quality specialist was hired to focus on nutrient and pesticide water quality issues in non-agricultural settings.

III. Evaluation of Pesticides in Groundwater and Surface Water

Pesticide Monitoring in Water Resources: Annual Data Report

The foundation of the MDA's evaluation efforts for pesticide and water quality is an annual data report. The complete data report and related information, including new surface water monitoring design and workplan documents, are available online at

<http://www.mda.state.mn.us/appd/ace/maace.htm> The MDA has a statutory requirement to "determine the impact of pesticides on the environment, including the impacts on surface and groundwater" (MN Chap 18B.04). To address this requirement, the MDA has a monitoring program that samples for pesticides and their breakdown products in water resources. The MDA collects samples from 85 locations with dedicated groundwater monitoring well nests in 10 counties where vulnerable soils serve as an indicator for potential problems elsewhere in the state. In 2004 – 2006 the groundwater monitoring program was expanded to include the establishment of initial networks in five additional PMRs of the state (regions 1, 5, 6, 7 & 8). This effort included the addition of 18 wells in 2005 and 28 wells in 2006, and sampling of additional springs in southeast Minnesota. Sampling of six Department of Natural Resources (DNR) hatchery springs also occurs in southeast Minnesota. In this region of the state, spring sampling is conducted in lieu of direct groundwater sampling given the difficulty of installing and effectively sampling groundwater in karst geology. Sampling of groundwater from 23 wells in urban areas has begun under a cooperative effort with the Minnesota Pollution Control Agency (PCA). Additionally, five semi-automated surface water monitoring stations located in southern Minnesota sample surface waters in both small and large scale, primarily agricultural, watersheds. Additionally, surface water sampling surveys are conducted to screen the general quality of rivers and streams across Minnesota. The MDA's updated approach to reporting monitoring results continues to provide a comprehensive review of MDA data on water resource impacts. Additional monitoring and evaluation data and a direct comparison of MDA data with groundwater and surface water standards and advisory values are now standard elements of the report. Thus, the report can be used to help make informed decisions regarding frequently detected pesticides in groundwater and concentrations of concern in surface water.

Compilation of Non-MDA Water Quality Data

The Groundwater Protection Act directs the MDA to review relevant pesticide-related water quality monitoring data in Minnesota. Recent groundwater pesticide data from the U.S. Geological Survey (USGS) and Dakota County Environmental Services were compiled as part of the MDA's annual tracking of pesticide impacts to water resources. Such information is now routinely reviewed in the evaluation of pesticide impacts to state water resources.

Establishment of new Pesticide Management Plan Committee

As part of the PMP revision process mentioned earlier in this report, a new committee was formed and met for the first time in July 2006. The new Pesticide Management Plan Committee (PMPC) provides informed comment to the Commissioner of Agriculture on significant water

quality decisions, such as whether to determine that a pesticide meets the statutory definition of “common detection” for groundwater, or the PMP’s definition of a “surface water pesticide of concern.” The committee’s structure and process preserves the commissioner’s statutory authority to make such determinations while engaging important stakeholders in the process of reviewing and commenting on water quality, pesticide use, climatic and other data. The PMPC membership was aligned with statutory references to those agencies and organizations tasked with developing the PMP and coordinating it among various agency plans. Thus, the PMPC now includes the PCA, the DNR, the Minnesota Department of Health (MDH) along with an industry representative, farmers, environmental groups, Extension personnel and other technical experts.

BMP Implementation and Effectiveness Evaluation Plan

Development of a draft BMP implementation and effectiveness evaluation plan began in May 2006 and is currently undergoing review. The draft plan was developed in response to the recommendation of the Office of the Legislative Auditor’s Program Evaluation Division report, “Evaluation Report: Pesticide Regulation.” The recommendation suggested that “The [MDA] should immediately develop and carry out a plan for evaluating the implementation and effectiveness of its best management practices.” The basis for the recommendation is provided on p. 99 of the report. The MDA commissioner accepted the recommendation, and the next Status Report will include additional information about the plan.

Standards Development

The MDH is responsible for developing health risk standards or advisory values for pesticides (and other contaminants) in groundwater and the MPCA is responsible for developing regulatory standards or advisory values for pesticides (and other contaminants) in surface waters. Both agencies are active participants in the PMPC and are fully informed regarding MDA monitoring efforts and results. In 2005-2006, progress was made in developing revised or additional standards for both groundwater and surface water pesticide or pesticide degradate contaminants. The MDA met with MDH on several occasions to discuss MDH’s proposed revisions to Health Risk Limit (HRL) calculations, and facilitated the transfer of important toxicological information between MDH, pesticide registrants and the EPA. An outcome of the ongoing exchanges is that some pesticides will have revised drinking water standards based on updated toxicological information, and some degradates for which there were previously no guidance for risk characterization now have HRLs or interim advisory values. Similar meetings have occurred with the MPCA, and new draft standards have been proposed for acetochlor and metolachlor in surface water.

MDA Laboratory Analyses for Pesticide Breakdown Products

The Groundwater Protection Act and the Pesticide Control Law contain references to the need for evaluation of groundwater or surface water for pesticide breakdown products, and the PMP acknowledges this need. During 2005-2006, MDA equipment and analytical methods have continued to provide the MDA with the ability to analyze for breakdown products of acetochlor, alachlor, dimethenamid and metolachlor. Recently, considerable effort has been put into development of methods for degradates of cyanazine, a banned herbicide whose degradates have been detected at concentrations of concern in vulnerable aquifers of Dakota County. Degradates of many pesticides have been identified in Minnesota groundwater and surface water, and in water resources monitored by other state and federal programs. Because of capacity limitations

and public health priorities, only groundwater samples are being analyzed for degradates of acetochlor, alachlor, metolachlor, metribuzin and dimethenamid. The MDA continues to routinely monitor for degradates of atrazine in both groundwater and surface water.

Pesticide Use Information

In order for the MDA and its stakeholders to evaluate the source of pesticide detections and concentrations in water resources, information on pesticide use is frequently needed or requested.

To better document relationships between water quality and overall pesticide use and use rates and BMP adoption, the MDA has been working with the National Agricultural Statistics Service (NASS) and its Minnesota office (MASS) to collect basic pesticide use and use rate information via phone surveys. Separate surveys are conducted in a two-year cycle. In the first year, a survey is conducted in the majority of crop-producing counties, yielding thousands of responses about pesticide usage (e.g., active ingredients used, acres treated, application rates) on commodity crop acreage. In the second year, a statewide survey is conducted to capture information about pesticide use practices (e.g., use of Best Management Practices, timing of application, utilization of application setbacks). The data are transformed for reporting purposes, and the data quality and relatively low associated collection costs yield some of the best pesticide use, use rate, and use practices data on a statewide and regional scale that the MDA has collected to date. The data also provide information useful in the review of water quality data and Best Management Practice (BMP) adoption. For more information, visit

<http://www.mda.state.mn.us/appd/pesticides/pesticideuse.htm>

A variety of sources publish information related to pesticide use in Minnesota. Each source has a particular reason for collecting information and a set of assumptions underlying its collection and reporting methods. In 2005-2006, data from some of these sources were available through the MDA's website. Examples of sources and related information include:

1. The MDA, which publishes annual pesticide sales data for crop production pesticide active ingredients based on pesticide registrant reporting requirements. The MDA also seeks to publish information on non-agricultural pesticide use, including annual pesticide sales data for select non-agricultural and urban pesticides. Care must be used when interpreting pesticide sales or use data. Pesticides sold in Minnesota may not be used in the same year they are sold, or in some cases may never be used in Minnesota. However, these sales data provide an indication of long-term pesticide use trends.
2. The Minnesota Agricultural Statistics Service (MASS), a division of the MDA, in conjunction with the National Agricultural Statistics Service (NASS), which conducts periodic surveys of major crop producers that collect information on pesticide use and use rates. Survey respondents are randomly selected, and the reported results are based on standardized statistical analyses conducted by NASS nationwide.
 - MASS/NASS annual chemical usage reports, including pesticide use and use rate information for Minnesota.
 - The MASS/NASS database can be searched on-line for specific crop/pesticide information.

- The MDA occasionally conducts special projects with MASS/NASS to evaluate pesticide use and related pesticide management practices. Project results are published by the MDA separately from MASS/NASS.
3. MDA's occasional surveys of farms in localized areas (several hundred acres) where community water supplies exhibit vulnerability to land use impacts or where other water quality concerns exist. Survey results are published by the MDA or other cooperators.
 4. Additional studies that are occasionally or periodically conducted by the MDA to assess pesticide use and use practices in both urban and rural settings.
 5. The MDA cooperates with the DNR on aquatic pesticide permitting and practices; the DNR publishes an annual report on the use of aquatic pesticides permitted under its authority.

The Minnesota River Report

In 2005-2006, the MDA continued to work cooperatively with Metropolitan Council Environmental Services, MPCA, and Minnesota State University-Mankato on a comprehensive report on sediment, dissolved oxygen, nutrient and pesticide concentrations in the Minnesota River and multiple tributaries ("State of the Minnesota River: Summary of Surface Water Quality Monitoring 2003", published in 2005). The evaluation brings data from multiple monitoring efforts and reports into a standard format at a single location. It also provides the foundation for consistency and comparability in sampling methodologies, calculations, data management and reporting, etc. The report is available electronically at <http://mrbdc.mnsu.edu>.

IV. Mitigation Activities

Education and Awareness

Education and raising a pesticide user's awareness of environmental concerns is one of the most important activities necessary to protect the state's water resources from the potential for leaching and runoff of pesticides. For this reason there is considerable overlap between prevention and mitigation activities. Those activities listed under prevention, although not repeated in this section, may be considered important mitigation steps.

Pesticide Best Management Practices Development

The development and promotion of pesticide Best Management Practices (BMPs) is both a prevention activity (see above) and a mitigation activity. Once BMPs are developed (a mitigation activity in response to monitoring detections and concentrations), their promotion and adoption become both a prevention and mitigation activity. The Commissioner's 2001 determination of common detection for atrazine, metolachlor and metribuzin initiated the process of developing pesticide-specific, voluntary BMPs. The development of pesticide specific BMPs is a required response under the Groundwater Protection Act for pesticides that are commonly detected in groundwater and for which the Minnesota Department of Health has established a drinking water Health Risk Limit (HRL). The BMP development effort expanded in 2003 when the Commissioner used his general authority under the Pesticide Control Law to determine that the frequency of detection of acetochlor and its breakdown products in groundwater should also

be addressed by BMPs, despite the absence of an HRL. Additionally, the Commissioner determined that acetochlor and atrazine are pesticides of concern in surface water, and thus BMPs for these herbicides include practices and measures to protect vulnerable surface water resources. The 2005 PMP provides an increased level of detail about the general process for BMP development and the factors to be considered in determining when BMPs should be developed for groundwater and surface water.

V. Other Pesticide-Related Environmental Activities

Pesticide Registration

The MDA began to draft protocols in late 2006 that will guide the review of pesticides, at the time of state registration, for their potential to contaminate groundwater or surface water resources at levels that might exceed relevant standards or guidelines, or at levels that might present unreasonable adverse affects on the environment. More information will be provided in the next PMP Status Report

Other MDA Pesticide Programs

The MDA has a number of pesticide-related programs designed to ensure the safe and proper use of pesticides and to reduce the risk from pesticides to human health and the environment. These programs address virtually every aspect of pesticide use and management in Minnesota. These include the following:

- Waste pesticide collection
- Empty pesticide container collection
- Pesticide applicator licensing & certification
- Permitting and inspection of pesticide storage and chemigation activities
- 24-hour emergency response to pesticide spills
- Environmental cleanup of contaminated pesticide sites and facilities
- Rapid cleanups to facilitate property transfers and development of rural brownfields through the Agricultural Voluntary Investigation and Cleanup (AgVIC) program
- Partial reimbursement of costs for environmental cleanup of pesticide releases through the Agricultural Chemical Response and Reimbursement Account (ACRRA)
- Pesticide use inspection to ensure compliance with pesticide labeling
- Pesticide misuse investigations
- Pesticide use data collection
- Enforcement of violations of pesticide law

Activities Coordinated with Other State Agencies

Other state agencies have statutory responsibilities related to the protection of the Minnesota's water resources. These inter-agency activities provide a forum for the discussion and coordination of many PMP-related issues. During 2005-2006:

- The MDA worked closely with other state commissioners and their staff through the Water Resources Committee and interagency workgroups on groundwater and surface water monitoring.

- The MDA continued to work with the Governor's Clean Water Cabinet, which includes the Commissioners of MPCA, DNR, MDA, MDH and the Board of Soil and Water Resources.
- The MDA, MPCA, and MDH continued to cooperate on the implementation of agreements on groundwater and surface water monitoring. These agreements have been published as the *Integrated Ground Water Quality Monitoring Strategy* and the *Cooperative Surface Water Quality Monitoring System* signed by the commissioners of applicable agencies. The agreements represent the Agencies' joint plan for conducting water quality monitoring on a statewide basis in Minnesota. The agreements can be reviewed at <http://www.mda.state.mn.us/appd/ace/maace.htm>
- The MDA continued to facilitate communications between the EPA's Office of Pesticide Programs and MDH toxicologists in order to obtain the necessary data for establishment of drinking water standards for pesticides.
- The MDA continued to work with MPCA on issues related to the development of surface water standards, and on improving coordination between surface water monitoring methods and MPCA's data needs for making surface water impairment decisions and implementation of its Total Maximum Daily Load initiatives.

VI. Conclusion

There continues to be a great deal of activity at the MDA in support of the PMP. Groundwater and surface water monitoring and surveying continues and has been expanded in critical areas; groundwater samples continue to be analyzed for additional pesticide degradation products; MDA monitoring data is being managed, reported and shared efficiently and effectively;; the MDA actively promotes Best Management Practices for all herbicide use in the state, and for five herbicides have been determined to be a concern groundwater or surface water; and the MDA has begun responding to the recommendations of a legislative audit of its pesticide programs. In addition, there have been many other MDA pesticide related projects and activities that are further described in this report. These many activities indicate that the MDA has continued to effectively implement the PMP during the 2005-2006 timeframe.

For additional information regarding this status report, the MDA's PMP and other MDA pesticide-related programs, please contact Dan Stoddard, Manager, Assistant Director for Environmental Programs, Pesticide and Fertilizer Management Division, by phone at 651-201-6291 or by email at dan.stoddard@state.mn.us