

An Assessment of Methods for Monitoring Urban Pesticide Use in Minnesota

The Minnesota Department of Agriculture
Pesticide and Fertilizer Management Division



March 2007

The Identification and Evaluation of Methods for Monitoring Urban Pesticide Use in Minnesota

March 23, 2007

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TABLE OF CONTENTS

Executive Summary	4
Introduction	5
Minnesota Statutes and the Legislative Audit.....	5
Purpose of Report.....	5
Eight Methods for Monitoring Urban Pesticide Use in Minnesota	9
Product Registration and Sales Database.....	9
Pesticides in Schools.....	13
Professional Applicator Surveys.....	16
Residential Pesticide User Surveys.....	18
Retail Shelf Surveys	21
Review Applicator Records.....	24
Pesticide Use Reporting	27
Point-of-Sale Data	31
Conclusions.....	36

Executive Summary

The Minnesota Department of Agriculture (MDA) is responsible under Minnesota Statute 18B.064 to monitor urban pesticide use on a biennial basis. This report outlines options to address this statutory requirement.

Pesticides in some form are used in nearly every sector of modern society, covering an enormous number of highly diverse applications. Because of their extremely widespread use, no single approach will likely provide a comprehensive summary of urban pesticide use. In addition, the collection of detailed use data for some types of pesticides, such as disinfectants and sanitizers, would be tremendously complicated and expensive. However, useful data could be obtained through the implementation of several options outlined in this report.

The Pesticide and Fertilizer Management Division (PFMD) of MDA has identified eight possible methods for monitoring urban pesticide use in Minnesota:

- 1) Utilize MDA's pesticide product registration database to capture urban pesticide trends.
- 2) Gain a more complete picture of pesticide use at schools by supplementing existing survey data on pest management practices in state school districts with additional survey data on the amount and types of pesticides currently used.
- 3) Survey professional urban pesticide applicators regarding their pesticide use practices and awareness of Best Management Practices (BMPs).
- 4) Survey non-professional/ residential urban pesticide users to gain a better understanding of their acquisition, use, and disposal habits.
- 5) Conduct pesticide retail shelf surveys to provide up-to-date information on marketplace trends such as pesticide product availability.
- 6) Sample the application records of licensed urban pesticide users and use statistical methods to create use trends.
- 7) Establish a pesticide use reporting system to collect, evaluate, summarize, retain, and report information on the use of pesticides in Minnesota.
- 8) Develop a method to periodically capture and analyze point-of-sale data for all persons who sell nonagricultural pesticides in the state.

Each of these methods is summarized in the report and reviewed with respect to five variables: advantages and disadvantages, possible timeline for implementation, relative costs and resources needed, costs from similar projects, and ease of implementation. MDA is currently moving forward with developing an application to utilize MDA's pesticide product registration database to capture urban pesticide trends. MDA is also moving forward with a detailed evaluation of three other options (school, professional applicator, and retail shelf surveys) and may conduct pilot studies to further evaluate these options.

Introduction

This study was prepared in response to a request by Representative Al Juhnke and Representative Karen Clark to provide information consistent with legislation that was introduced in 2006, directing MDA to conduct a study that would identify and evaluate several possible methods to monitor urban pesticide use biennially.

Currently in Minnesota, information regarding the amount and type of pesticides applied in residential, public, institutional, commercial, and industrial areas is limited. This information could be useful to help evaluate the potential for human exposure and risk of environmental impacts from specific pesticides. Pesticides in some form are used in nearly every sector of modern society, covering an enormous number of highly diverse applications (Figure 1- *Categories of Urban Pesticide Use*). No single approach to pesticide use monitoring can easily provide detailed use data given the many diverse uses of pesticides. The collection of detailed use data for some types of pesticides, such as disinfectants and sanitizers, could be extremely complicated and expensive. However, useful data could be obtained through the implementation of options outlined in this report.

Minnesota Statutes and the Legislative Audit

The Minnesota Department of Agriculture (MDA) is responsible by Minnesota Statute 18B.064 to monitor rural and urban pesticide use on a biennial basis. In March of 2006, the Office of the Legislative Auditor for the State of Minnesota completed an evaluation report on pesticide regulation in Minnesota. This audit report stated that MDA should develop and implement a consistent approach to monitor urban pesticide use biennially. The audit discussed several options that the department should consider including monitoring certain types of nonagricultural pesticide applications, such as those made by structural applicators or turf and ornamental applicators. The audit went on to suggest that the department could sample pesticide application records from these hired applicators to estimate the amount and type of pesticides used statewide. As an alternative, the audit suggested that MDA survey school districts about the amounts and types of pesticides they use. Lastly, the audit indicates the MDA could collect product sales data during registration in a manner that would allow for the calculation of nonagricultural pesticides distributed in the state¹.

Purpose of Report

This report is designed to provide the MDA, Minnesota Legislature, and other interested parties with information regarding differing approaches to monitor urban pesticide use biennially. It is intended as a brief assessment of several urban pesticide use reporting options. It should not be viewed as a detailed feasibility study. A detailed feasibility study, which would be necessary prior to the implementation of several of the listed options, is a significant project which exceeds the scope of this report.

The report analyzed eight options for monitoring urban pesticide use. They are:

- 1) Utilize MDA's pesticide product registration database to capture urban pesticide trends.
- 2) Gain a more complete picture of pesticide use at schools by supplementing existing survey data on pest management practices in state school districts with additional survey data on the amount and types of pesticides currently used.
- 3) Survey professional urban pesticide applicators regarding their pesticide use practices and awareness of Best Management Practices (BMPs).

¹ Office of the Legislative Auditor, State of Minnesota, "Evaluation Report: Pesticide Regulation," March 2006.

- 4) Survey non-professional/ residential urban pesticide users to gain a better understanding of their acquisition, use, and disposal habits.
- 5) Conduct pesticide retail shelf surveys to provide up-to-date information on marketplace trends such as pesticide product availability.
- 6) Sample the application records of licensed urban pesticide users and use statistical methods to create use trends.
- 7) Establish a pesticide use reporting system to collect, evaluate, summarize, retain, and report information on the use of pesticides in Minnesota.
- 8) Develop a method to periodically capture and analyze point-of-sale data for all persons who sell nonagricultural pesticides in the state.

Each option was analyzed with the following considerations:

- A summary of the monitoring approach
- Advantages
- Disadvantages
- Possible timeline for implementation
- Relative costs and resources needed
- Costs from similar projects
- Ease of implementation

The results of the review are summarized in Table 1- *A Summary of Methods for Monitoring Urban Pesticide Use in Minnesota* (found in the conclusion section).

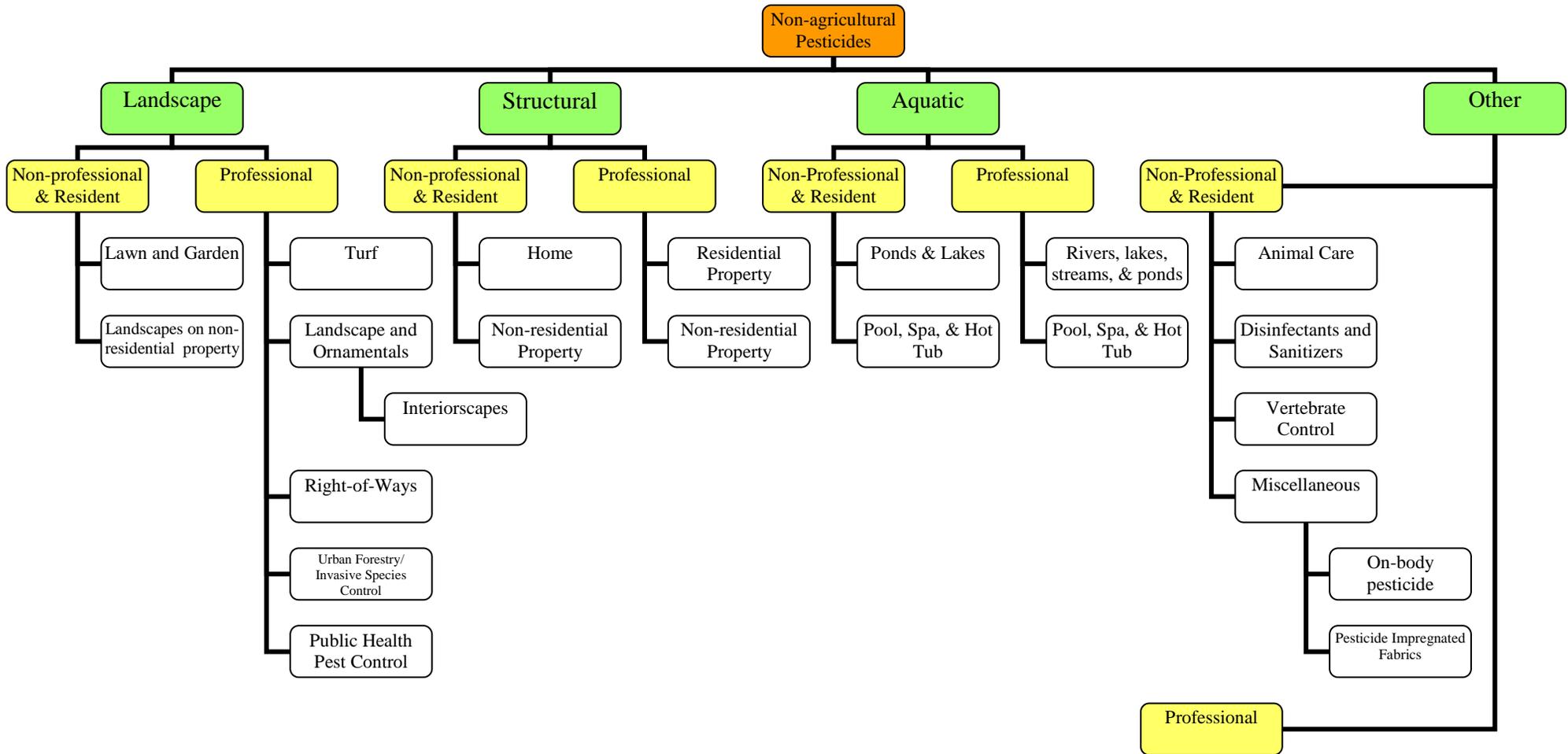
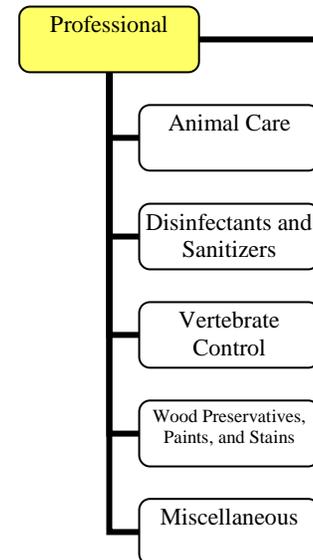


FIGURE 1: CATEGORIES OF URBAN PESTICIDE USE

- Represents all non-agricultural pesticide use in Minnesota
- Urban pesticide applicator categories
- Professional verses non-professional/ residential pesticide applicators
- Pesticide application site or category



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Eight Methods for Monitoring Urban Pesticide Use in Minnesota

Product Registration and Sales Database

1. Utilize MDA's pesticide product registration database to capture urban pesticide trends.

Activity Summary

The MDA pesticide product registration database tracks pesticide product sales in the state. In the past, this database has been most commonly used to assess agricultural pesticide sales by active ingredient. More recently there has been a growing interest in using MDA's pesticide product registration database to examine urban related pesticide trends.

Presently, the non-agricultural pesticide product registration database is being modified so sales data can be tracked using the following information: EPA registration number, product name, active ingredient, pesticide composition (liquid or solid and percent of active ingredient), initial registration year, sales by calendar and fiscal year, volume of amount sold, units for how the pesticide was sold, registration status, use restrictions, and use type. This data can be used to describe what types of products are sold, offered for sale, or distributed for use in urban areas. In addition, this data can track what pesticides are the most common in the urban pesticide marketplace according to the pesticides principal use. Currently, there are 12 pesticide product type categories that are used to group pesticides according to their principle use listed on the pesticide label. These groups include the following:

- Disinfectants and sanitizers
- Agricultural crops
- Garden and lawn
- Home
- Turf and ornamental
- Miscellaneous
- Animal care
- Pool, spa, and hot tub
- Structural
- Industrial, right-of-way, and forestry
- Wood preservatives, paints, and stains
- Vertebrate Control

With additional resources the database could be restructured to support additional information from existing state or federal databases or possibly to support geographic designations for sales (details are described in the discussion section). A feasibility study would need to be implemented first to determine if this approach would deliver meaningful results.

Advantages

In its present form, the pesticide registration database provides general trends for the most popular products including product substitutions in the pesticide product market. A redesign of the database would offer even more opportunities to examine trends in pesticide product sales when coupled with pesticide label data. Furthermore, pesticide product sales data can be used to support other monitoring data such as use statistics, retail shelf surveys, or pesticide user group surveys.

Disadvantages

Although the pesticide product registration database contains valuable sales data, significant limitations regarding the use of this database should be noted. This database was originally designed as a tool for registering pesticides and was not designed to track pesticide use data. It is labor intensive to extract meaningful data using the database's current design. As a result, significant changes are needed to better utilize the pesticide information available in this database. These changes would require considerable resources including at least one additional technical staff member to manage the database. Even if the database is restructured, there is no method to distinguish products that were sold but never used.

Discussion:

Examples of Possible Changes to the Database

When tracking urban pesticide data, it is most useful to describe trends by several different parameters including pesticide active ingredient, pesticide type (e.g. herbicide, insecticide, fungicide), pesticide chemical class (e.g. organophosphate, pyrethroid, phenoxy), pesticide application site (e.g. golf course, park, cemetery, residential site), pesticide label signal words (danger, warning, caution), and market sector (industry, commercial, government, and home & garden).

A possible consideration would be grouping sales data by geographic designations such as zip codes or watersheds. Adding these geographic designations would require changes to registrant reporting and may be very difficult to implement. Consideration of adding such locational data would require a detailed feasibility study. Additionally, it may be necessary to meet with pesticide registrants to discuss the capability of reporting sales locations.

Data from MDA's pesticide product registration database may become even more powerful when coupled with information from other pesticide-related databases such as the National Pesticide Information Retrieval System (NPIRS) and the NPIRS State Pesticide Information Retrieval System (NSPIRS). The NSPIRS database contains state pesticide information with associated federal label data including:

- Federal status
- Site of application
- Pests to be controlled
- Active ingredient
- EPA registration number
- Formulation
- Signal word
- Use restriction
- Registration dates
- Product use types
- Products with child resistant packaging
- State brand name
- State company name
- State registration number
- Year of last registration

Presently, there is limited capacity to link this data with Minnesota's pesticide product sales data. Additional resources would be required to link the entire NSPIRS database with MDA's pesticide product registration database.

Relative Costs

Very High	High	✓ <u>Medium</u>	Low
Greater than \$500,000	\$150,000 – 500,000	\$50,000 – 150,000	Less than \$50,000

Costs associated with this monitoring approach are approximately \$50,000 – 150,000. Some of the estimated costs to implement this method include:

- Development of a new database
- Staff devoted to the project
- Technical support: database administration, management, communication, and quality assurance

Ease of Implementation:

Phase 1 – high

Phase 2- medium to high

There are two phases to this approach. The first phase is currently being implemented by MDA and does not require changing the structure or content of the pesticide product registration database. With additional funding and staff, the activities described in the second phase may be accomplished, with a feasibility study conducted first.

PHASE 1

Activities that can currently be conducted:

- Track and group pesticide sales based on key terms in the product name (e.g. lawn, turf, grass, weed, insect, crabgrass killer, fairway)
- Starting with data from 2005, track the top 100² pesticides sold, offered for sale, or distributed in Minnesota by pesticide product name, active ingredient, volume or amount sold, units for how the pesticide was sold, registration status, use restrictions, formulation, pesticide type (e.g. herbicide, insecticide, fungicide), pesticide label signal words (danger, warning, caution), and initial registration year.
- Track the top 10 pesticides sold, offered for sale, or distributed in Minnesota over time, grouped by existing MDA product type categories.
- Track the number of different pesticide products containing multiple active ingredients or fertilizers.

PHASE 2

A list of activities that could be accomplished by restructuring MDA's database, adding content from other databases such as NSPIRS, and changing registrant reporting requirements:

- Track all of the existing data on pesticides sold, offered for sale, or distributed in Minnesota over time by product name, active ingredient, volume of amount sold, units for how the pesticide was sold, registration status, use restrictions, formulation, pesticide type, site of application, pests to be controlled, signal word, and registration dates.

² Only the top 100 because this data would have to be manipulated using the existing database structure. Additional data, including formulation, pesticide type, and pesticide label signal words, would have to be entered manually because they do not currently exist in the database.

- Track pesticides listed by the U.S. EPA as B2 carcinogens and pesticides that are cholinesterase inhibitors.
- Track active ingredients contained in pesticide products that have been given reduced-risk status by the U.S. EPA.
- Compare product sales data in Minnesota with national pesticide market statistics.
- Link pesticide product data with information from other pesticide related databases or data tracking centers such as the Extension Toxicology Network (EXTOXNET), Pesticide Action Network's (PAN) database, or the National Environmental Public Health Tracking Program.

Timelines

A report with the content described in Phase 1 could be completed biennially, with the first report completed in 2008, without any additional funding. However, to develop a system to report with the content described in Phase 2 would require additional resources, initially take two years to develop, and thereafter would be reported biennially.

Pesticides in Schools

- 2. Gain a more complete picture of pesticide use at schools by supplementing existing survey data on pest management practices in state school districts with additional survey data on the amount and types of pesticides currently used.**

Activity Summary

Pesticide use surveys at public K-12 schools may help inform the public, researchers, and policy makers about where and why pesticides are used, the potential risk for exposure, where potential pesticide management challenges lie, and where more research efforts should be directed. Surveys could be directed at groups who are authorized to apply pesticides at public K-12 schools. According to Minnesota Statute 18B.095, these groups include the following:

- Structural pest control applicator;
- Commercial or noncommercial pesticide applicator with appropriate use category certification; or
- School pest management coordinator or a school employee with school pest management knowledge.

Multiple approaches may be required to adequately monitor pesticides applied by these authorized groups; including mail or phone surveys along with information collected from school pesticide notification records³ and other on-site written pesticide application records. School pest management coordinators could be contacted through an appropriate agency who maintains a registry of these coordinators⁴.

Surveys could also be sent to other groups who are authorized to apply pesticides at schools, such as professional pest control companies or building maintenance engineers. The school pest management coordinator could be contacted to get a list of these pesticide applicators. The following is a sample of questions that could be directed at respondents:

- What are the key pests you treat for indoors?
- What pesticides do you use to treat these pests indoors?
- What are the key pests you treat for outdoors?
- What pesticides do you use to treat these pests outdoors?
- When are these pesticides applied?
- When choosing a pesticide what influences your decision?
- How frequently do you apply these pesticides?

³ Refer to the discussion section for a more detailed explanation of these notification records.

⁴ According to Minnesota Statute 18B.095, a registry of school pest management coordinators is maintained by the Departments of Health, Administration, Education; the University of Minnesota Extension Service; and the Minnesota School Boards Association.

Advantages

Detailed and accurate surveys on pesticide use at schools can provide information appropriate for risk assessments that rely on exposure estimates. This information would also help target outreach and education efforts directed at groups who apply pesticides at schools. Contacting these groups may be straightforward because a registry of school pest management coordinators is maintained by law. These surveys would be facilitated by MDA's staff.

Disadvantages

Depending on the sample size, these survey methods can be time consuming and may require additional staff to complete. It may be difficult to transcribe hand-written pesticide notification records and on-site pesticide application records. This information may then need to be copied into a pesticide related database at MDA. Along with this, a system would need to be designed to keep specific applicator information confidential. It may be difficult to retrieve these application records and recruit survey participants.

Discussion:

Details Concerning School Pesticide Notification Records

Limited school pesticide use information is publicly available based on the Parents' Right-to-Know Act of 2000. Minnesota Statute 121A.30 states that a school that plans to apply a pesticide which is a toxicity category I, II, or III pesticide product or a restricted use pesticide on school property, must provide a notice to parents and employees that it applies such pesticides. The notice must provide that an estimated schedule of the pesticide applications is available for review or copying at the school offices where such pesticides are applied. A school that uses one of these pesticides must keep a copy of all notifications required for at least six years in a manner available to the public.

Relative Costs:

Very High	High	✓ <u>Medium</u>	Low
Greater than \$500,000	\$150,000 – 500,000	\$50,000 – 150,000	Less than \$50,000

Costs associated with this monitoring approach are approximately \$50,000 – 150,000. Some of the costs for the survey activities listed above can be estimated by examining contractor costs from previous school pesticide use studies. The MDA has conducted two studies related to pesticide use in schools.

Quantitative Research Regarding Pest Management Practices in Minnesota K-12 Schools⁵
COST ESTIMATE: \$21,000

⁵ Funded By: US EPA, Region 5, Chicago, Illinois-
Report completed December 1999
Prepared By:
CJ Olson Market Research Inc.
2125 East Hennepin Avenue, Suite 100
Minneapolis, MN 55413

Minnesota Head Start/ Day Care/ Preschool Pest Management Practices Survey⁶
COST ESTIMATE: \$19,000

Additional costs to implement this method may include:

- Staff to collect pesticide data from schools
- Computing resources to record pesticide use information into a database
- A possible contract with a market research firm to develop and/or implement a survey

Ease of Implementation: High

The ease of tracking school pesticide use will depend on the resources available to implement surveys and record application records. Some additional considerations when collecting pesticide use information from schools include:

- The school sample size
- The number of records collected from each school
- The reliability of pesticide use records at schools
- The type of information tracked at each school [How consistent is this information?]

Timelines

Given adequate resources, a survey could be conducted biennially starting in 2008. In addition, a random sample of written application records could be obtained from schools every other year and a data summary included in a comprehensive report on urban pesticide use in Minnesota.

⁶ Funded by: US EPA, Region 5, Chicago, Illinois-
Report completed September 2002
Prepared By:
Minnesota Center for Survey Research
University of Minnesota
2331 University Avenue SE, Suite 141
Minneapolis, MN 55414-3067

Professional Applicator Surveys

3. Survey professional urban pesticide applicators regarding their pesticide use practices.

Activity Summary

There are multiple ways to deliver surveys to professional urban pesticide applicators. Often, government agencies and non-profits contract with a social science research center or professional research group to conduct surveys. These groups frequently have the best experience in survey delivery, especially when polling large groups over the phone, because they have access to computer assisted telephone interviewing equipment and software to accurately obtain data and preserve the random nature of samples. Partnering with a professional group, such as the Minnesota Nursery and Landscape Association or the Golf Course Superintendent Association of America, is another approach to delivering surveys to licensed pesticide applicators. Web-based surveys may also be appropriate for certain pest control professionals. It is often challenging to get good response rates from surveys. The quality of data may improve when a combination of these approaches is applied to each pesticide user group. A feasibility study would need to be conducted to evaluate the best approach.

Advantages

Data gathered from surveying professional pesticide applicators is useful in confirming trends observed from pesticide sales databases. Surveys can be designed to collect information about pesticide use behavior and awareness of pesticide BMPs. In addition, surveys provide valuable insight for developing successful outreach and education programs that are adapted to the unique pest problems of each pesticide user group.

Disadvantages

The disadvantages associated with this monitoring approach are similar to school pesticide use surveys. Depending on the sample size, these survey methods can be time consuming and may require additional staff to complete. It may also be difficult to recruit survey participants.

Relative Costs

Very High	High	✓ <u>Medium</u>	Low
Greater than \$500,000	\$150,000 – 500,000	\$50,000 – 150,000	Less than \$50,000

Costs associated with this monitoring approach are approximately \$50,000 – 150,000. A portion of the costs associated with this approach may include professional research and consultant services. Cost estimates from previous surveys conducted by MDA and the University of Wisconsin- Madison indicate that professional survey research services may cost approximately \$20,000⁷ - 40,000⁸ per survey group.

⁷ Relative to contract costs from previous school pesticide use surveys conducted by MDA.

⁸ US EPA Pesticide Environmental Stewardship Program Regional Initiative Grant to survey the pest management practices of urban professional landscapers in the Lake Monona Watershed of Wisconsin.
COST ESTIMATE: \$40,000

Some additional costs to implement this method include:

- Staff to facilitate survey design and implementation
- Technical support
- Computing resources to record and report survey results

Ease of Implementation: Medium

To determine the feasibility of these surveys, a pilot survey should be conducted with only one group that manages urban pests in Minnesota. For example, a survey could be conducted with lawn service or tree care companies, under the category turf and landscape professionals (see chart below for breakdown of different turf and landscape groups). The pesticide practices of turf and landscape professionals are likely to have the greatest impact on surface and ground water quality compared to other urban pest professionals. Other groups such as structural applicators may be more relevant to evaluate direct human exposure. Later, lessons learned from surveying these groups will lead to better methods for monitoring professional groups such as structural pest control operators.

Turf and Landscape Professional Groups in Minnesota:

Note: Although these groups are licensed by MDA under the same category, when developing surveys it is appropriate to separate them into two categories.

1. Professional Turf

Pesticide applications made to golf courses, sports turf, cemetery grounds, parks, school grounds, and other commercial, public and residential property by applicators with a commercial or non-commercial turf & ornamentals or general ground pesticide license. Licensed applicators may include the following groups:

- Public and private golf course superintendents
- Public and private cemetery grounds managers
- Government employees such as parks and recreation landscape managers
- Sports turf managers
- Lawn service companies
- School maintenance supervisors
- Landscape management service

Defined by MNLA⁹ as - a firm that specializes in maintaining residential or commercial site turf grass.

2. Professional Landscape and Ornamentals

Pesticide applications made to commercial, public, and residential property to control pests on ornamental trees, shrubs, and flowers by applicators with a commercial or non-commercial turf & ornamental or general ground pesticide license. Licensed applicators may include the following groups:

- Professional Landscape Maintenance Companies (who make incidental pesticide treatments to ornamental plants)
- Professional Garden Service Companies
Defined by MNLA as- A firm that specializes in the design, installation, and/or care of residential or commercial-site gardens.
- Tree Care Companies/ Arborist
- Landscape pest specialists
- Public Employees such as parks and recreation landscape managers

Timelines

Given adequate resources, surveys could be developed by fall of 2007 and implemented in 2008.

⁹ Minnesota Nursery and Landscape Association

Residential Pesticide User Surveys

4. Survey non-professional/ residential urban pesticide users to gain a better understanding of their pesticide acquisition, use, and disposal habits.

Activity Summary

Information on the attitudes and behavior of non-professional and/or residential pesticide applicators can help explain pesticide use and sales trends and can be used to develop successful outreach and education programs. Approaches for delivering such surveys may be very different than methods used to survey professional pesticide applicators and residents may be more or less open to participating in pesticide use behavior surveys. Survey types may include:

- An initial phone survey to gather participants, followed by a paper or web-based survey where residents and/or non-professionals track their pesticide use.
- A household phone survey conducted by a marketing research firm to gather information on pesticide use behavior (including pesticide acquisition, use, safety, storage, and disposal).
- A door-to-door survey conducted by Master Gardeners or a similar volunteer group to determine the most commonly used pesticides applied to homes, lawns, and gardens.
- A pest control survey conducted at public events related to gardening and/or housekeeping such as home and gardening expos, local environmental fairs, or the state fair.

Advantages

The advantages of this monitoring approach are similar to professional pesticide applicator surveys. Data gathered from surveying non-professional/ residential pesticide users is useful in confirming trends observed from retail shelf surveys, sales data, and pesticide use statistics. These surveys also provide valuable insight for developing successful outreach and education programs that are adapted to unique household pest problems. Furthermore, data collected from these surveys could be used in other long-term studies on the human health effects of pesticide exposure.

Disadvantages

The challenges of surveying professional and non-professional pesticide users are similar. It can be difficult to recruit survey participants and get good response rates. Overall data quality may improve when multiple approaches are applied.

Discussion:

Oregon's Household Pest Control Product Survey

Starting in 2007, the Oregon Department of Agriculture (ODA) was mandated to conduct a household pest control product survey as part of their effort to monitor all pesticide use in Oregon. Survey results for 2007 will be published in an annual report (starting in 2008) summarizing the pesticide use data reported to ODA and will help gain a better understanding of non-professional pesticide use practices. In Oregon, volunteers statewide have agreed to keep track of their household pest control product use by filling out a reporting form for each pesticide application.

Residents are asked to fill out the following information on the reporting form:

-
- | | |
|---|---|
| <p>1) Where used
<input type="checkbox"/> Indoor
<input type="checkbox"/> Outdoor
<input type="checkbox"/> Both
<input type="checkbox"/> Other, specify</p> <p>2) Brand name or manufacturer</p> <p>3) Product name</p> <p>4) EPA Reg. No.</p> <p>5) Full container size (indicate amount and unit)
Full container amount _____
Unit
<input type="checkbox"/> Ounces
<input type="checkbox"/> Pounds
<input type="checkbox"/> Pints
<input type="checkbox"/> Quarts
<input type="checkbox"/> Other, specify</p> | <p>6) Total amount of product used and unit
Total amount used _____
Unit
<input type="checkbox"/> Ounces
<input type="checkbox"/> Pounds
<input type="checkbox"/> Tablespoons
<input type="checkbox"/> Teaspoons
<input type="checkbox"/> Pints
<input type="checkbox"/> Quarts
<input type="checkbox"/> % of container used
<input type="checkbox"/> Other, specify</p> <p>7) Problem or purpose of application
<input type="checkbox"/> Fleas
<input type="checkbox"/> Insects
<input type="checkbox"/> Mosquitoes
<input type="checkbox"/> Moss
<input type="checkbox"/> Plant disease
<input type="checkbox"/> Rodents
<input type="checkbox"/> Snail/ slug
<input type="checkbox"/> Spiders
<input type="checkbox"/> Weeds
<input type="checkbox"/> Other, specify</p> |
|---|---|
-

Relative Costs

✓ <u>Very High</u>	✓ <u>High</u>	✓ <u>Medium</u>	Low
Greater than \$500,000	\$150,000 – 500,000	\$50,000 – 150,000	Less than \$50,000

Cost estimates may vary significantly depending on the survey approach (with an approximate range of \$50,000 – 900,000). Costs for a simple survey may be comparable to estimated costs for school pesticide use surveys (\$20,000). However, more detailed surveys conducted biennially are likely to cost more. A study from Oregon estimated the following total costs for conducting state-wide, statistical surveys of household pesticide use:¹⁰

- At-home personal interviews- \$883,000¹¹
- Telephone interview (in English and Spanish)- \$250,000¹²
- Mail-in questionnaire- \$183,000¹³

Some additional estimated costs to implement this method include:

- Staff to facilitate survey implementation
- A possible contract with a market research firm to develop and/or implement a survey
- Computing resources to record and report survey results

Ease of Implementation: Medium

A detailed feasibility study should be conducted to determine the best approach to surveying non-professional/ residential pesticide users. Other considerations for this survey approach include:

- Survey design
- The willingness of volunteer groups such as Minnesota Master Gardeners, 4-H, or FFA to help implement a household pesticide use survey.
- The interest of University of Minnesota researchers in helping implement such surveys.
- Methods for protecting confidential information collected.

Timelines

Given adequate resources, surveys could be developed by fall of 2007 and implemented in 2008.

¹⁰ Rothlein, Joan and Jenkins, Jeffrey. 2000. Oregon Pesticide Use Reporting System Analytical Review. Oregon Department of Agriculture. Salem, Oregon. <http://www.oregon.gov/ODA/PEST/docs/pdf/anreview.pdf>

¹¹ Direct costs include labor costs for the level of specialization at \$550,000, additional costs to have survey conducted by university researchers- \$250,000, and cost for an initial phone survey to recruit participants at \$83,000.

¹² Includes 20,000 telephone interviews (including questionnaire design, data collection, analysis, and report)

¹³ Includes \$75,000 in direct costs for 9,000 surveys to be mailed and a maximum of 5,000 surveys to be mailed back. In addition, there are costs for developing the primary and secondary sampling list vial telephone contact, for notification, post-stratification, and consent for participation.

Retail Shelf Surveys

5. Conduct pesticide retail shelf surveys to provide up-to-date information on marketplace trends such as pesticide product availability.

Activity Summary

Retail shelf surveys provide up-to-date information on the type of pesticides being sold and their availability in one particular metro area. These non-professional marketplace surveys can be taken at a variety of stores who sell pesticides including large home supply stores (e.g. Home Depot, Lowes), grocery and drug stores, discount department stores (e.g. Walmart, Target, Kmart), hardware stores, and retail nurseries. The following information can then be recorded about the types of products available on store shelves:

- Product name
- Active ingredient
- EPA registration number
- Product formulation
- Application sites listed on label
- The amount of shelf space devoted to pest control products
- Additional notes about products on-sale or highlighted at store end-caps

Surveys should ideally be conducted in the late spring or early summer when pesticides are prominently displayed on end caps and near garden checkout areas¹⁴. Surveys should also be conducted when shelves are most likely to be well stocked such as at the end of the week. It is important to note that these shelf surveys only serve as non-quantitative indicators of urban pesticide use patterns.

Advantages

Retail shelf surveys provide a broad initial assessment of the types of pesticides available to consumers in one particular metro area. This data can be used to support data from other pesticide use surveys. These surveys may help:

- Identify the types of pesticides dominating the marketplace.
- Identify the phase out of certain products from store shelves.
- Observe the mix of brands on store shelves.
- Identify the presence of less-toxic alternative pest control products such as insecticidal soaps.
- Identify the types of products highlighted at seasonal displays, end-caps, or near checkout areas.

¹⁴ TDC Environmental. 2005. San Francisco Bay Area Pesticide Retail Store Survey. Prepared for the San Francisco Estuary Project Board. San Mateo, California. <http://www.tdcenvironmental.com/2003ShelfSurvey.pdf>

Disadvantages

Information collected from retail shelf surveys has limited value and should be used appropriately.

- This survey data only describes the types of products available to consumers in one particular metro area. Given current resources, it is not feasible to survey every store that sells pesticides in Minnesota.
- Data may be used to support other monitoring approaches but it is not a stand-alone approach.
- Data collected from retail shelf surveys is not appropriate for estimating urban pesticide use.
- Products sold at stores in one metro area of Minnesota may not represent trends expressed throughout the state.

Discussion:

San Francisco Bay Area Pesticide Retail Store Surveys

Since 2002, the EPA and State Resources Control Board in California have funded three retail shelf survey projects¹⁵. The purpose of these surveys has been to provide an understanding of the pesticides that are currently being sold and used by non-professional applicators in the San Francisco Bay Area. As an example of the value of a retail shelf survey, these surveys have made some of the following conclusions:

- Pyrethroids are now dominating the insecticide marketplace.
- Diazinon and chlorpyrifos phase out is evident.
- Brand mix changes, depending on the market share of pesticide manufacturers.
- Participation in the “Our Water, Our World” (a pest control outreach program in the San Francisco Bay Area) program may correlate with stocking less-toxic alternative pest control products.
- Seasonal displays generally highlight pyrethroid insecticides or weed-and-feed herbicides.
- Tralomethrin occurs in outdoor consumer products that may have enough use to have the potential to contribute to surface water quality impacts from pyrethroids.

Relative Costs

Very High	High	Medium	✓ <u>Low</u>
Greater than \$500,000	\$150,000 – 500,000	\$50,000 – 150,000	Less than \$50,000

Costs associated with this approach are estimated to be less than \$50,000 and may include:

- Staff time to conduct surveys
- Access to a state vehicle
- Computing resources to collect and store data

¹⁵ TDC Environmental. 2005. San Francisco Bay Area Pesticide Retail Store Survey. Prepared for the San Francisco Estuary Project Board. San Mateo, California:
<http://www.tdcenvironmental.com/2003ShelfSurvey.pdf>
<http://www.tdcenvironmental.com/Final2004ShelfSurvey3.pdf>
<http://www.tdcenvironmental.com/Final2005ShelfSurvey.pdf>

Ease of Implementation: High

With an appropriate store sample size in one metro region (approximately 10 stores total), these surveys are often inexpensive and quick to conduct.

Timelines

Given adequate resources, a retail shelf survey could be completed in three months in the twin cities metro region (subject to availability of staff resources) and a report on the results of these surveys could be completed within one year.

Review Applicator Records

6. Sample the application records of licensed urban pesticide users and use statistical methods to create use trends.

Activity Summary

A random sample of commercial and noncommercial records could be taken from a select group of licensed applicators throughout Minnesota. Pesticide applicators under the following non-agricultural license types and categories maintain non-agricultural pesticide use records:

- Structural Pest Control Applicator
- Aquatic Pest Control Applicator
- Noncommercial Applicator Only
 - Aquatic
 - Food processing pest control
 - Noncommercial structural
- Commercial or Noncommercial Applicator
 - Turf and ornamentals
 - Forest spraying
 - Right-of-ways
 - Mosquito control
 - Pocket gopher
 - Wood preservatives
 - Antimicrobial
 - Sewer root control

Records maintained by these applicators contain detailed information about how pesticides are used in urban environments (assuming applicators are directly following pesticide regulations). Minnesota Statute 18B.37 states that a commercial or noncommercial applicator, or the applicator's authorized agent, must maintain a record of pesticides used on each site for five years after the date of treatment. It is important to note that reporting requirements for commercial and noncommercial applicators are different than requirements for structural pest control applicators.

Advantages

Sampling pesticide use records would help provide a broad initial assessment of the pesticide use practices of professional applicators. These use records may help identify situations where certain pesticides are being used incorrectly, resulting in a higher risk of exposure of unintended targets. In addition, this information would provide a spatial reference for urban pesticide use that would be difficult to accomplish by only referring to pesticide sales data.

Disadvantages

The accuracy of use records maintained by the applicator is unknown. In addition, some education and enforcement may be necessary for inadequate records. It may be difficult to transcribe and manage large amounts of hand-written data from these records. Depending on the sample size, significant staff resources and office space could be needed to transcribe this data and manage a database.

Discussion:

Detailed Content of Pesticide Application Records

According to Minnesota Statute 18B.37, application records must contain the following information:

For all pest control applicators-

- date of the pesticide use;
- time the pesticide application was completed;
- brand name of the pesticide, the U.S. EPA registration number, and dosage used;
- name and address of the customer;
- name and signature of applicator, name of company, license number of applicator, and address of applicator company;
- and any other information required by the commissioner.
- Portions of records not relevant to a specific type of application may be omitted upon approval from the commissioner.
- All information for this record requirement must be contained in a single page document for each pesticide application, except a map may be attached to identify treated areas. For the rights-of-way and wood preservative categories, the required record may not exceed five pages. An invoice containing the required information may constitute the required record. The commissioner shall make sample forms available to meet the requirements of this paragraph.
- A commercial applicator must give a copy of the record to the customer.
- Records must be retained by the applicator, company, or authorized agent for five years after the date of treatment.

For all pest control applicators EXCEPT structural pest control-

- number of units treated;
- temperature, wind speed, and wind direction;
- location of the site where the pesticide was applied;

For structural pest control operators only (in additional to the items mentioned above) -

- target pest;
- for fumigation, the temperature and exposure time

Relative Costs

Very High	✓ High	Medium	Low
Greater than \$500,000	\$150,000 – 500,000	\$50,000 – 150,000	Less than \$50,000

This pesticide use monitoring program would require substantial funding. Costs associated with this monitoring approach are approximately \$150,000 – 500,000. Some of the estimated costs to implement this method include:

- A new computer database to collect and store data
- Technical support
- Staff time collecting use records from applicators

Ease of Implementation: Low

There are many challenges to this monitoring approach. The number of application records maintained and stored by non-agricultural pesticide user groups is difficult to quantify. It may not be feasible to track application records from all non-agricultural pesticide user groups. A more practical approach may be to select records from only a few applicator groups who have the greatest potential to impact human health and water quality. This may include applicators with a structural pest control, commercial or noncommercial turf and ornamentals, and a commercial or noncommercial right-of-ways license. The number of records retrieved from these applicators would be dependent on staff time and resources. Sampling methods would need to be carefully examined to make certain of their statistical accuracy. Once a group of pesticide applicators is selected, a decision would need to be made on how many records to retrieve from one applicator. These hand-written records would then need to be transcribed into a database. A method would also need to be designed to aggregate this data to keep information about the individual applicator confidential.

Timelines

Given adequate resources, surveys could begin in 2008 with an initial report by winter 2009.

Pesticide Use Reporting

7. Establish a pesticide use reporting system to collect, evaluate, retain, and report information on the use of pesticides in Minnesota.

Activity Summary

A pesticide use reporting system, when designed correctly, could track pesticide use according to a geographical reference such as a zip code or a watershed. Such a system would be useful in answering the following questions:

- What types of products are being used in urban areas?
- Where are these products being applied?
- How often are they applied?
- How much product is applied to a site per year?
- What is the purpose of these pesticide applications?

Methods for collecting, storing, and reporting pesticide use data and the associated costs require a great deal of thought and consideration. Before implementing such a system, MDA would need to conduct a detailed feasibility study and a review of existing pesticide use reporting systems followed by a pilot program.

Advantages

In general, a pesticide use reporting system can help¹⁶,

- Granting agencies understand where efforts to promote pesticide BMPs are succeeding or failing.
- Researchers better identify emerging challenges and direct research attention.
- Regulators arrive at realistic policy decisions that are both environmentally and economically sound.
- The public understand why certain pesticides are used.
- Locate and evaluate risk.

Disadvantages

There are many challenges associated with designing and managing a pesticide use reporting system. Examples may include:

- High costs associated with establishment and maintenance.
- Poor compliance with pesticide use reporting laws and tracking those who do not report pesticide use.
- Data uncertainty associated with errors such as typographical mistakes, misidentification of the amount of product used, omitted data, and record duplicates.

¹⁶ Epstein, Lynn. 2006. California's Pesticide Use Reports and Trends in Pesticide Use. Outlooks on Pest Management August 2006, 148-154.

Discussion:

How other states collect pesticide use information

When considering the development of a pesticide use reporting system in Minnesota it is useful to look at what other states have accomplished. Several states, including California, Oregon, New York, Arizona, New Jersey, and New Hampshire, have pesticide use reporting requirements that vary significantly in history, scope, and stage of development. One of the most notable and comprehensive systems to date was enacted in Oregon in 2005. Oregon law states that the State Department of Agriculture shall design, develop, and implement a pesticide use reporting system that includes each major category of use, including agriculture, forestry, industrial, urban commercial and urban homeowner uses. The law goes on to state that at least one time each year the department should collect the best data practicable from each major category of pesticide use in a manner that reduces paperwork and costs.

Within two years, the design¹⁷ of this system was completed and in January of 2007 Oregon's Pesticide Use Reporting System (PURS) became fully operational. With the exception of pesticide use by homeowners, all other pesticide use is reported electronically via a secure website. Groups that must report pesticide use include:

- Agriculture industry
- Forest industry
- Government agencies
- Utility companies
- Pest control companies
- Landlords and managers of rental property, motels, hotels, restaurants, etc...

Pesticide use must be reported once per year at minimum and all pesticide applications for a year must be reported no later than January 31st of the following year. Pesticide use records that get collected, summarized, and retained in Oregon's database include:

- Date of application
- Amount of undiluted product applied
- Product identification
- Purpose of application
- Location (water basin¹⁸ or ZIP code¹⁹)

A similar law in Minnesota would require significant funding. The law in Oregon was originally written in 1999 but was not enacted until 2005 because of budget shortfalls. If such a system is implemented in Minnesota, a more thorough investigation should be conducted on the major challenges Oregon faced to develop PURS.

¹⁷ Prior to the actual design of this database the Oregon Department of Agriculture conducted an analytical review using the expertise of staff at Oregon State University and the Oregon Health Sciences University. This science based review identifies, describes, and evaluates various options for a pesticide use reporting system in Oregon. A link to this report can be found at: <http://www.oregon.gov/ODA/PEST/docs/pdf/anreview.pdf>

¹⁸ Pesticide application locations are reported by water basin for the following application sites: agriculture, aquatic, forestry, public health/regulatory pests, right-of-way, research, and other.

¹⁹ Pesticide application locations are reported by ZIP code for the following application sites: urban/general indoor and outdoor

Relative Costs

✓ <u>Very High</u>	High	Medium	Low
Greater than \$500,000	\$150,000 – 500,000	\$50,000 – 150,000	Less than \$50,000

This pesticide use monitoring program would require substantial funding; costs are estimated to be greater than \$500,000.

Some of the estimated costs to implement this method include:

- A new computer server to store information contained in the database
- Technical support: database administration, management, communication, and quality assurance
- A computer-based error checking program
- Staff devoted to collecting, reviewing, and editing use records from applicators
- Staff devoted to producing yearly summary reports

Cost comparisons from other states include:

- In Oregon, funding for the development of the pesticide use reporting system is collected from pesticide registration fees and the General Fund, this equates to approximately \$800,000 per biennium, beginning in 2002 and ending in 2009²⁰.
- In Oregon, additional one time funding to initiate the pesticide use reporting law came from the states General Fund; for the biennium beginning in 2005, \$956,287 was appropriated²¹.
- In California, the pesticide use reporting system is financed by a tax on pesticide sales, levied at the point of first sale in the state; in 2006, the tax was 2.1%²².
- In California, the 2007-2008 operations budget for pesticide use reporting is approximately \$1,767,000²³.

²⁰ Chapter 1059, Oregon Laws 1999 section 3 states:

Funding was given to implement Oregon's PURS for the years beginning January 1, 2002, and ending December 31, 2009. Up to \$40 in registration fees for each pesticide, formula or formulation may be used by the department for the implementation of the pesticide use reporting system as long as the Legislative Assembly appropriates an equivalent amount of moneys from the General Fund for the system. The registration fee may not exceed \$160 for each pesticide, formula or formulation. ** Note: In 2005, Oregon registered 10,681 pesticide products [http://oregon.gov/ODA/news/pub_0612br.shtml]

²¹ Chapter 1059, Oregon Laws 1999 section 5 & 6 states:

In addition to and not in lieu of any other appropriation, there is appropriated to the State Department of Agriculture, for the biennium beginning July 1, 2005, out of the General Fund, the amount of \$956,287. For the biennium beginning July 1, 2005, as the maximum limit for payment of expenses for administrative and support services from fees, moneys or other revenues, including Miscellaneous Receipts, and including federal funds for contract services, but excluding lottery funds and federal funds not described in this section, collected or received by the State Department of Agriculture, is increased by \$672,897 for the purpose of carrying out sections 2-9, chapter 1059, Oregon Laws 1999.

²² This figure is from a study conducted by the Department of Plant Pathology at the University of California Davis. Epstein, Lynn. 2006. California's Pesticide Use Reports and Trends in Pesticide Use. Outlooks on Pest Management August 2006, 148-154.

²³ The California Department of Pesticide Regulation's budget- <http://www.ebudget.ca.gov/pdf/GovernorsBudget/3890/3930.pdf>

Ease of Implementation: Low

The size and complexity of a PURS system depends on the extent of use reporting by pesticide applicators. When designing such a system one must consider:

- Who reports?
- What is reported?
- How often is it reported?

The feasibility of such a system also depends on:

- Resources available to applicators such as computers and internet access to file use reports electronically.
- State resources available to ensure the accuracy, reliability, and validity of the database.
- Legal issues such as the confidentiality of use records.

Timelines

Given the history of Oregon's PURS system it could take several years to develop a use reporting system in Minnesota.

Point-of-Sale Data

8. Develop a method to periodically capture and analyze non-agricultural pesticide point-of-sale data.

- **Option 1- Acquire marketing research data**
- **Option 2- Collect data directly from stores that sell pesticides**

Activity Summary

Limited market research and pesticide sales data can be tracked using Universal Product Codes (UPCs) and individual stock numbers (SKU codes). This point-of-sale data may be collected from two sources, from the site of the final purchase or from marketing research firms.

Option 1: Collect data from market research companies such as VISTA

For a user fee, point-of-sale data can be tracked using marketing research data from Vista Information Systems (VISTA).²⁴ VISTA provides point-of-sale data for home and garden products sold by hardware and home improvement stores in the United States. Data from VISTA, which covers non-professional/residential pesticide products, come from individual retail companies and stores who voluntarily supply information such as the container size, product type, and formulation for each UPC. This reporting is voluntary, meaning only a portion of all products sold in retail stores are represented by their data. The following is a list of data provided by VISTA:

- Usage site (indoor or outdoor use)
- Product sales data
- Product name
- Pricing
- Units sold
- UPC
- Categorized by region (National, Northeast, South, Midwest²⁵, and West)
- Categorized by sales channel
 - Mass Merchants – major department store chains
 - Chain Home Centers- major retail chains focused on home improvement products.
 - Hardware Stores/ Independents – smaller, independently owned franchises and “mom & pop” stores focused on home improvement products
- UPC
- EPA registration number
- Active ingredient
- Formulation
- Product name

Data obtained from the VISTA database can then be linked (using the UPC code) with data from Kelly Registration Systems (KRS)²⁶ to identify general point-of-sales trends for pesticides based on active ingredient.

²⁴*Use of point-of-sale data to track usage patterns of residential pesticides: methodology development*
Nyree, Bekarian, Devon Payne-Sturges, Stuart Edmondson, Bill Chism, and Tracey J. Woodruff
May 25, 2006
Environmental Health: A Global Access Science Source, 5:15
<http://www.ehjournal.net/content/5/1/15>

²⁵ Midwest region includes: ND, SD, NE, KS, MN, IA, MO, MI, WI, IL, IN, OH

Option 2: Collect data directly from stores that sell pesticides.

It may be possible to collect pesticide sales data from individual stores using UPC bar codes. For such a system to work two assumptions need to be made:

1. Labels on pesticides have a UPC bar code.
2. The pesticide product scanned at point of purchase and inventory is tracked through the use of either SKU or UPC codes.

Pesticide sale information (tracked by UPC code) could be periodically downloaded from each store to a state-run database for summarization and analysis. The data downloaded from each store could include:

Company information:

- Month of reporting
- Retail business name
- Business ID number
- Address
- County

Pesticide Sales information:

- Product name
- EPA registration number
- Store ID number (UPC code)
- Number of packages sold

Advantages

Option 1: Collect data from market research companies such as VISTA

According to a study conducted by the US EPA²⁷, the benefits associated with using marketing research data may include:

- Detecting abnormal trends in regional and seasonal pesticide sales trends, warranting further investigation into the potential causes of these trends.
- Determining the most commonly purchased application types.
- Comparing relative trends in sales between indoor and outdoor use products as well as comparing trends in sales between different active ingredients.

²⁶ KRS is a database of all registered pesticide products that is updated electronically on a regular basis. Data from KRS includes: UPC code, product name, EPA registration number, active ingredient, formulation, and manufacturer information.

²⁷ *Use of point-of-sale data to track usage patterns of residential pesticides: methodology development*
Nyree, Bekarian, Devon Payne-Sturges, Stuart Edmondson, Bill Chism, and Tracey J. Woodruff
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Option 2: Collect data directly from stores that sell pesticides.

Benefits of collecting point-of-sale data directly from stores may include:

- Very specific regional and/or neighborhood trends in consumer behavior associated with pesticide sales.
- May identify product substitutions in the pesticide product market.
- Information collected may help target better outreach and education efforts

Disadvantages

Option 1: Collect data from market research companies such as VISTA

According to a study conducted by the US EPA²⁸, there are many disadvantages to this monitoring approach:

- Not all merchants are willing to report sales information to marketing companies.
- Merchants may cease reporting to marketing companies at any time. If the merchant is a large retail chain, this can have a profound effect on sales figures.
- VISTA does not include sales data from lumber yards, lawn and garden stores such as nurseries, club stores, grocery stores, and veterinary clinics.
- Data is not geographically specific. Most marketing companies do not report their sales data at a geographic level any finer than a wide regional level, such as the Midwest.
- Access to these databases is limited because companies are reluctant to make information public.

Option 2: Collect data directly from stores that sell pesticides.

The following are some disadvantages of tracking sales at the final point of purchase:

- Designing and implementing such a system may be very expensive
- Validating data collected from individual stores may be difficult
- Sales data only represents the ownership of a product and does not indicate use.
- Some retailers do not scan their merchandise or use electronic record keeping to track sales and inventory.

²⁸ *Use of point-of-sale data to track usage patterns of residential pesticides: methodology development*
Nyree, Bekarian, Devon Payne-Sturges, Stuart Edmondson, Bill Chism, and Tracey J. Woodruff
May 25, 2006
Environmental Health: A Global Access Science Source, 5:15
<http://www.ehjournal.net/content/5/1/15>

Relative Costs

Option 1: Collect data from market research companies such as VISTA

Very High	High	✓ <u>Medium</u>	Low
Greater than \$500,000	\$150,000 – 500,000	\$50,000 – 150,000	Less than \$50,000

Costs associated with this monitoring approach are approximately \$50,000 – 150,000. Costs for obtaining this data would include:

- User access fees to use VISTA or data from another market research company
- Staff devoted to project
- Technical support

Option 2: Collect data directly from stores that sell pesticides.

✓ <u>Very High</u>	High	Medium	Low
Greater than \$500,000	\$150,000 – 500,000	\$50,000 – 150,000	Less than \$50,000

This pesticide use monitoring program would require substantial funding; costs are estimated to be greater than \$500,000. Some of the estimated costs to implement this method include:

- A contract with a software vendor to develop a system to track pesticide UPC data at the point-of-purchase.
- A new computer database to collect and store UPC data from all retail outlets that sell pesticides in Minnesota.
- Technical support: database administration, management, communication, and quality assurance
- Staff time collecting point-of-sale data from stores

Ease of Implementation:

Option 1- medium

Option 2- very low

Option 1: Collect data from market research companies such as VISTA

A pilot study could be proposed to further investigate the feasibility of this monitoring approach. Pesticide products must be matched to their assigned UPC codes and then linked to other data sources (that contain information such as pesticide active ingredient, percent active ingredient, pesticide type, formulation, and EPA registration number) to create a customized dataset.

Option 2: Collect data directly from stores that sell pesticides.

A pilot study could be proposed to further investigate the feasibility of this monitoring approach. Collecting pesticide sales data from the site of final purchase requires significant technical resources²⁹. MDA would need to find a software vendor to customize a program to prepare pesticide sale tabulations at the end of each reporting period into a database. A vendor would also have to develop a system of codes to identify the sale of pesticides at each store, then on a monthly basis a vendor could pull sales

²⁹ Details on the feasibility of this approach came from the following study:
Rothlein, Joan and Jenkins, Jeffrey. 2000. Oregon Pesticide Use Reporting System Analytical Review. Oregon Department of Agriculture. Salem, Oregon. <http://www.oregon.gov/ODA/PEST/docs/pdf/anreview.pdf>

data based on these codes and report it to MDA. This would create an inconvenience for vendors. At this time, it is unknown how well vendors would be able to comply with such a system. For example, a selection of smaller stores that sell pesticides may not electronically scan their merchandise. MDA could require pesticide sales reporting only for stores with total annual sales greater than \$800,000 (or some set dollar amount) to eliminate most stores that do not scan their merchandise.

Timelines

Option 1: Given adequate resources, data could be collected and analyzed within two years.

Option 2: This approach would take several years to develop.

Conclusions

Analysis of urban pesticide trends can help inform the public, researchers, and urban pest managers about where and why pesticides are used, where potential pesticide management challenges lie, and where more research efforts should be directed. This report reviewed eight possible methods for monitoring urban pesticide use in Minnesota (a summary is provided in Table 1- *A Summary of Methods for Monitoring Urban Pesticide Use in Minnesota*).

With the current resources available, it is not feasible for MDA to implement all of these monitoring strategies. Since the legislative audit was published in February 2006, the Pesticide and Fertilizer Management Division (PFMD) of MDA has hired an urban pesticide use advisor to develop ways to track and monitor urban pesticide use. The PFMD division is also implementing methods for tracking non-agricultural pesticide sales using the pesticide registration database. As a part of this effort, active ingredient information is being added to the pesticide registration database for all non-agricultural pesticides. This database enhancement will allow the MDA to report pesticide sales by active ingredient and pesticide category. MDA is also moving forward with a detailed evaluation of three other options (school, professional applicator, and retail shelf surveys) and may conduct pilot studies to further evaluate these options.

The MDA has identified three additional approaches for pilot scale implementation:

- 1) Gain a more complete picture of pesticide use at schools by supplementing existing survey data on pest management practices in state school districts with additional survey data on the amount and types of pesticides currently used.
- 2) Survey the pesticide use practices of professional urban applicators.
- 3) Conduct pesticide retail shelf surveys.

Several other states have adopted rigorous methods for tracking urban pesticide use (many of them are discussed in this report). These methods can provide detailed information on the type, quantity, and location of urban pesticide use; however, they are generally quite expensive and require a detailed feasibility study prior to implementation, which is beyond the scope of this report.

Table 1. A Summary of Methods for Monitoring Urban Pesticide Use in Minnesota

Monitoring Approach	Advantages	Disadvantages	Possible Timeline for Implementation	Relative Costs & Resources Needed	Ease of Implementation
1) Pesticide Product Registration Database- Utilize MDA's pesticide product registration database to capture urban pesticide trends.		In general- There is no method to distinguish products that were sold but never used.			
PHASE 1- Currently being implemented	Provides sales trends including replacement shifts in the pesticide product market and does not require changing the structure & content of the database.	The current database is not designed to track pesticide data and it is labor intensive to extract meaningful data using the current design.	Begin concept November 2007 with first report planned in 2008.	<i>Medium:</i> <ul style="list-style-type: none"> ▪ Technical support ▪ Staff devoted to project 	High
PHASE 2- Restructure the database, adding content from other databases and changing registrant reporting requirements.	Same benefits as #1 plus more specific pesticide information from the pesticide label or other sources.	Changes would require considerable resources.	Initially, this would take two years to develop and thereafter would be reported biennially.	<i>Medium to High:</i> <ul style="list-style-type: none"> ▪ Development of a new database 	Medium - High
2) Pesticides in Schools- Supplement existing survey data on pest management practices in state school districts with additional survey data on the amount and types of pesticides currently used.	Describes pesticide use trends that could help target better outreach and education efforts to further prevent children from being exposed to pesticides.	Depending on the sample size, survey methods can be time consuming and may require additional staff to complete. It may also be difficult to get good survey response rates.	Biennially starting in 2008	<i>Medium:</i> <ul style="list-style-type: none"> ▪ Staff to collect pesticide data & facilitate survey ▪ Computing resources ▪ Contract with research firm 	High
3) Professional Applicator Surveys- Survey the pesticide use practices of professional urban applicators.	Confirms trends observed from pesticide related databases. In addition, surveys provide valuable insight for developing successful outreach and education programs.	[Same disadvantages as # 2.] It may also be difficult to recruit survey participants.	Surveys could be developed by fall 2007 and implemented biennially starting in 2008.	<i>Medium:</i> <ul style="list-style-type: none"> ▪ Staff to facilitate survey ▪ Computing resources ▪ Contract with research firm 	Medium
4) Residential Pesticide User Surveys- Survey the pesticide acquisition, use, and disposal habits of non-professional/ residential urban pesticide users.	[Same benefits as #3]	[Same disadvantages as # 3.]	Surveys could be developed by fall 2007 and implemented biennially starting in 2008.	<i>Medium to Very High:</i> [Same as # 3.]	Medium - Low
5) Retail Shelf Surveys- Conduct pesticide retail shelf surveys to provide information on marketplace trends such as pesticide product availability.	Provides up-to-date information on product availability and marketing trends for one particular metro area that can enhance data collected from other monitoring approaches.	Data has limited value. Does not indicate what is being used or where it is being used and it is not feasible to survey all stores in MN.	Could be developed and completed within 3 months.	<i>Low:</i> <ul style="list-style-type: none"> ▪ Staff time ▪ Computing resources to collect and store data. 	High
6) Review Applicator Records- Sample the application records of licensed urban pesticide users and use statistical methods to create use trends.	Provides a broad initial assessment of the pesticide use practices of professional applicators.	Difficult to transcribe and manage large amounts of hand-written data from application records.	Surveys could begin in 2008 with an initial report by winter 2009.	<i>High:</i> <ul style="list-style-type: none"> ▪ New computer database ▪ Technical support ▪ Staff time 	Low
7) Pesticide Use Reporting- Establish a pesticide use reporting system to collect, evaluate, retain, and report information on the use of pesticides in Minnesota.	Provides comprehensive long-term data on the pesticide use practices of professional applicators. Costs are significantly reduced when data is submitted electronically.	High start up and maintenance costs, compliance issues, data uncertainty associated with errors, and problems with public access.	Would take several years to develop.	<i>Very High:</i> <ul style="list-style-type: none"> ▪ New computer server and database ▪ Error checking program ▪ Technical support ▪ Production of reports 	Low
8) Point-of-Sale Data- periodically capture and analyze point-of-sale data.					
OPTION 1- Acquire marketing research data.	Gives regional & seasonal point-of-sale trends.	The data is not consistent & geographically specific to MN.	Data could be collected & analyzed within 2 yrs	<i>Medium:</i> <ul style="list-style-type: none"> ▪ Fee for collecting data 	Medium
OPTION 2- Collect data directly from stores.	Provides geographically specific information on consumer behavior.	The data is expensive to collect and depending on the store size, the data may not be consistent.	Would take several years to develop.	<i>Very High:</i> [Same as # 7.]	Very Low