PRODUCT STEWARDSHIP INSTITUTE

How-To Guide for Advancing Pesticide Stewardship

What's Inside?

September 2019

1. Whom is this Guide for?

This How-to Guide is intended to help state and local government officials who play a key role in setting policies, managing pesticide waste, and purchasing new, safer pesticides.

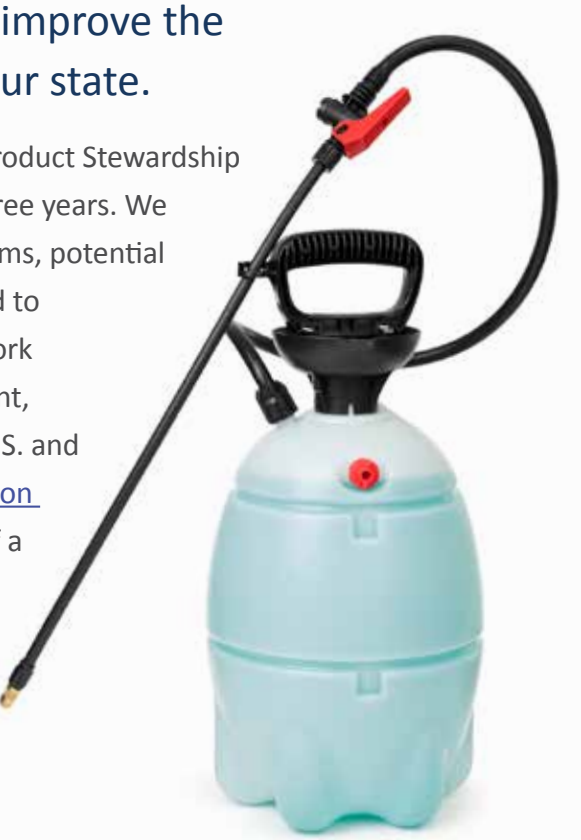
This How-to Guide provides guidance and strategies for improving pesticide stewardship programs that collect and safely manage unwanted pesticides.

The Guide will also be valuable for other stakeholders involved in the pesticide life cycle, including manufacturers, major buyers of pesticides (e.g., agricultural and non-agricultural sectors, residential consumers, government, universities, retailers, etc.), transporters, waste management companies, and environmental groups.

2. Why Do You Need this Guide?

The purpose of the Guide is to help you understand best practices and equip you to improve the management of pesticides in your state.

This Guide is informed by research that the Product Stewardship Institute (PSI) has conducted over the past three years. We have gathered national insights on the problems, potential solutions, data, policies, and programs related to end-of-life management of pesticides. This work included interviews and surveys of government, industry, and other stakeholders across the U.S. and Canada, as well as a national webinar discussion on pesticide stewardship and development of a Pesticide Stewardship Briefing Document.



3. What are the Problems with Pesticide Management in the U.S.?

While many state and local government officials are working hard and devoting substantial resources to safely manage unwanted pesticides, significant problems persist. State government representatives across the U.S.—including officials managing the top-performing pesticide stewardship programs—indicate that the primary issues related to the end-of-life management of pesticides are:

1. **Lack of Convenient Collection** Locations
2. **Low Consumer Awareness** of Pesticide Toxicity, Risks, and Collection Opportunities
3. **Lack of Sustainable Financing** for Collection, Education, and Safe Management

An additional challenge is the **lack of comprehensive data** on pesticide program performance across the U.S. This information is needed to gain a clearer understanding of the full extent of the problems associated with unwanted pesticides and to establish a quantitative basis to gauge and improve pesticide stewardship.

Pesticides that are not collected for safe disposal are either stockpiled or disposed in landfills and down household or storm drains, where the pesticides enter surface water and groundwater. When stored or stockpiled, pesticides pose unnecessary health and environmental risks from accidental poisonings, fires, and leaks or spills. Without convenient, safe disposal options, households and businesses are also forced to hold onto particularly dangerous pesticides that have been phased out—like DDT.

Pesticides improperly disposed can result in significant clean-up costs. In Florida alone, the U.S. Environmental Protection Agency (EPA) has designated about 20 Superfund sites that have pesticides listed as a contaminant of concern,[1] resulting in millions of dollars of cleanup costs at taxpayer expense. Even investigations of environmental contamination from chemicals can cost tens of millions of dollars.[2]

Lack of Convenient Collection

Many state and local governments collect unwanted pesticides as a service for their residents, farmers, and businesses.

Some state-run programs only collect pesticides and some local government programs collect small quantities of pesticides with other household hazardous waste (HHW), which includes paint, batteries, solvents, and other toxic household products. Some HHW programs also accept pesticides from small agricultural or commercial generators, often for a fee.

Pesticides that are not collected for safe disposal are either stockpiled or disposed in landfills and down household or storm drains where the pesticides enter surface water and groundwater.

Unwanted pesticides are collected primarily through drop off at permanent collection sites and one-day collection events. Large quantities or particularly hazardous materials may be picked up directly from homes, farms, and businesses.

For agricultural pesticide containers, there is also a voluntary industry initiative run by the Ag Container Recycling Council (ACRC) across the U.S. that collects and recycles high density polyethylene (HDPE) pesticide containers of 55 gallons or less.

But the demand for collection is often greater than the services that governments can provide with their current financial resources. From our research, 18 states reported having no permanent collection sites for household pesticides, while 33 states reported having no permanent collection sites for non-household pesticides. In addition, many states indicated that there is a widespread need for more collection infrastructure in both rural and urban areas.

In some cases, state officials intentionally design their programs to be less convenient due to concerns that they will receive more pesticides for disposal than their budgets allow. These programs may reduce the frequency or number of collection events, limit the hours of operation, or have few or no permanent collection options.

When stored or stockpiled, pesticides pose unnecessary health and environmental risks from accidental poisonings, fires, and leaks or spills.

The lack of *permanent* collection locations for pesticides can contribute to pesticide stockpiles and unnecessary storage risks, especially if there are no collection events when generators are in immediate need of disposal options (e.g., a farmer or resident is moving, or a landscaper is going out of business).

In contrast, as the number of permanent sites in Iowa have increased the opportunities for proper management of HHW, the impacts of poisoning from household hazardous materials has decreased in this state. Between 2007 and 2018, accidental poisonings from these materials decreased 40% overall and 50% for children under age six.[3]

The lack of collection programs for empty pesticide *containers* results in many of these containers unnecessarily being thrown in the trash. The containers add to the solid waste disposal burden, while the remaining pesticide residues create hazards to public health and the environment. While ACRC's program accepts *agricultural* pesticide containers, municipalities and states often do not have the resources to collect and recycle *household* generated containers, and some material recovery facilities specifically exclude pesticide containers.

The lack of financial resources among government agencies has resulted in a scarcity of convenient collection opportunities. Across the country, there is a great need for more pesticide drop-off locations that are conveniently accessible for urban and rural populations. Greater collection convenience will better enable collection of pesticides and pesticide containers from a range of generators, including farmers, businesses (e.g., golf courses, landscapers), government agencies, institutions (e.g., universities), and households.

Pesticide stewardship[4] in the U.S. lags in comparison with how other products are managed.

Many products are much less toxic and hazardous than pesticides, yet are being collected, recycled, and properly managed at notable rates or are the focus of comprehensive collection and waste management efforts. For example:

Batteries

Vermont's single-use battery recycling program provides extensive statewide collection opportunities—98% of residents live within 10 miles of a drop-off location.[5]

Mattresses

More than 63% of discarded mattresses were recycled in 2016 in Connecticut[10] and, in California, over 90% of residents have a mattress collection option within a 15-mile drive.[11]

Carpet

95% of California's population lives within a county with access to one or more collection sites where carpet is collected for recycling.[6]

Paint

In Connecticut, 51% of leftover paint generated was collected for recycling in 2016[12] and there are currently 146 year-round drop-off sites within 15 miles of all Connecticut residents.[13] Also, California has 827 year-round paint drop-off sites consisting of paint retailers, municipal HHW facilities, solid waste transfer stations, and other voluntary locations.[14] The program provides access to a year-round site within 15 miles for 98.5% of the state's population.[15]

Fluorescent Lamps

In Vermont, 37% of lamps were recycled in 2012[7] and there are more than 150 collection sites in the state.[8] In Washington state, there are 295 permanent collection sites.[9]

Low Consumer Awareness

Another widespread problem is low consumer awareness of **collection opportunities** for unwanted pesticides and containers, and of the **toxicity and risks** associated with these products.[16]

Household pesticide consumers may believe that if a product is sold for home use, then it is safe for them, their children, and their pets, and assume that any unwanted product can be placed in the garbage.

When acquiring pesticides, household consumers often lack adequate information to select the appropriate type and quantity of pesticide for their need. Company sales practices typically offer a lower unit price for larger quantities of product than for smaller quantities. This practice often leads consumers to purchase more than they need, resulting in leftover pesticides requiring disposal.

Although the U.S. Environmental Protection Agency (EPA) and many states set stringent requirements for hazardous waste generated by businesses, they do not regulate similar wastes generated in the home.

Federal, and most state, laws do not prohibit trash disposal of HHW, including pesticides. Although the U.S. Environmental Protection Agency (EPA) and many states set stringent requirements for hazardous waste generated by businesses, they do not regulate similar wastes generated in the home.

Residents, therefore, often unknowingly put HHW in the trash without understanding the dangers. They may not realize that waste workers and others can be exposed to the hazardous chemicals, which can damage the liver, kidneys, and central nervous system, and increase the risk of cancer. They also may not know that putting these chemicals in the trash also threatens our drinking water supplies when improperly disposed.

Residents may also store unwanted pesticides in their homes or garages for long periods of time, unaware of available collection options and the potential impacts that are associated with long-term storage—including unnecessary health and environmental risks from accidental poisonings, fires, leaks, and spills.

Agriculture, commercial, and municipal/institutional pesticide users are educated in the proper selection and use of pesticides. However, like residents, they may also be unaware of collection options and potential impacts (human health, environmental, economic) associated with long-term storage and improper disposal of pesticides.

Lack of Sustainable Funding

Funding for unwanted pesticide collection programs is inadequate and unsustainable.

While partial industry funding is provided through existing pesticide registration fee programs, these programs are **managed by government** and incur costs beyond collection and disposal, including program oversight, education, and enforcement. Voluntary industry initiatives, such as ACRC's pesticide container recycling program, have "free riders"—manufacturers that benefit from the end-of-life product management program but don't contribute funding to pay for the costs of collection and processing.

After paint, pesticides are the most costly HHW product for governments to manage. In Portland, Oregon, a study conducted from 2011-2012 indicated that Metro, a regional government in the Portland area, incurred a cost of approximately $2.02 per pound to manage pesticides. That's almost twice the cost paid for the average of all HHW disposed ($1.03 per pound).[17] The study also indicated that although pesticides accounted for only about 6% of Metro's HHW quantity, disposal of these materials consumed 14% of the total disposal costs for all HHW.[18]

Although producers may pay a pesticide registration fee that helps fund disposal in some states, there is **no incentive to reduce unwanted pesticide volumes** and stem the quantity of unwanted household pesticides, which, in at least some states, is growing at a much faster rate than waste from other sectors.

While 24 states use funding from pesticide registration fees to partially fund disposal, the other **26 states either do not have state-run pesticide disposal programs or fund these programs from a variety of sources** that include enforcement settlements, state environmental funds, state toxics control accounts, cost sharing between large farms and businesses, and/or U.S. EPA grants. **These funds are often intermittent or allocated year to year and not guaranteed.** Local government HHW facilities also share the financial burden of pesticide disposal through taxpayer-funded collection and disposal of discarded pesticides from residents.

While more than 40 states have state-run pesticide disposal programs,[19] many do not have dedicated funding, and some operate only intermittently. And although all states require pesticide manufacturers to pay a **pesticide registration fee**, the following is also the case:

Often, funds from pesticide registration fees are **used for purposes such as training, licensing and registration, and program administration** and *not* to finance the proper management and disposal of unwanted pesticides.

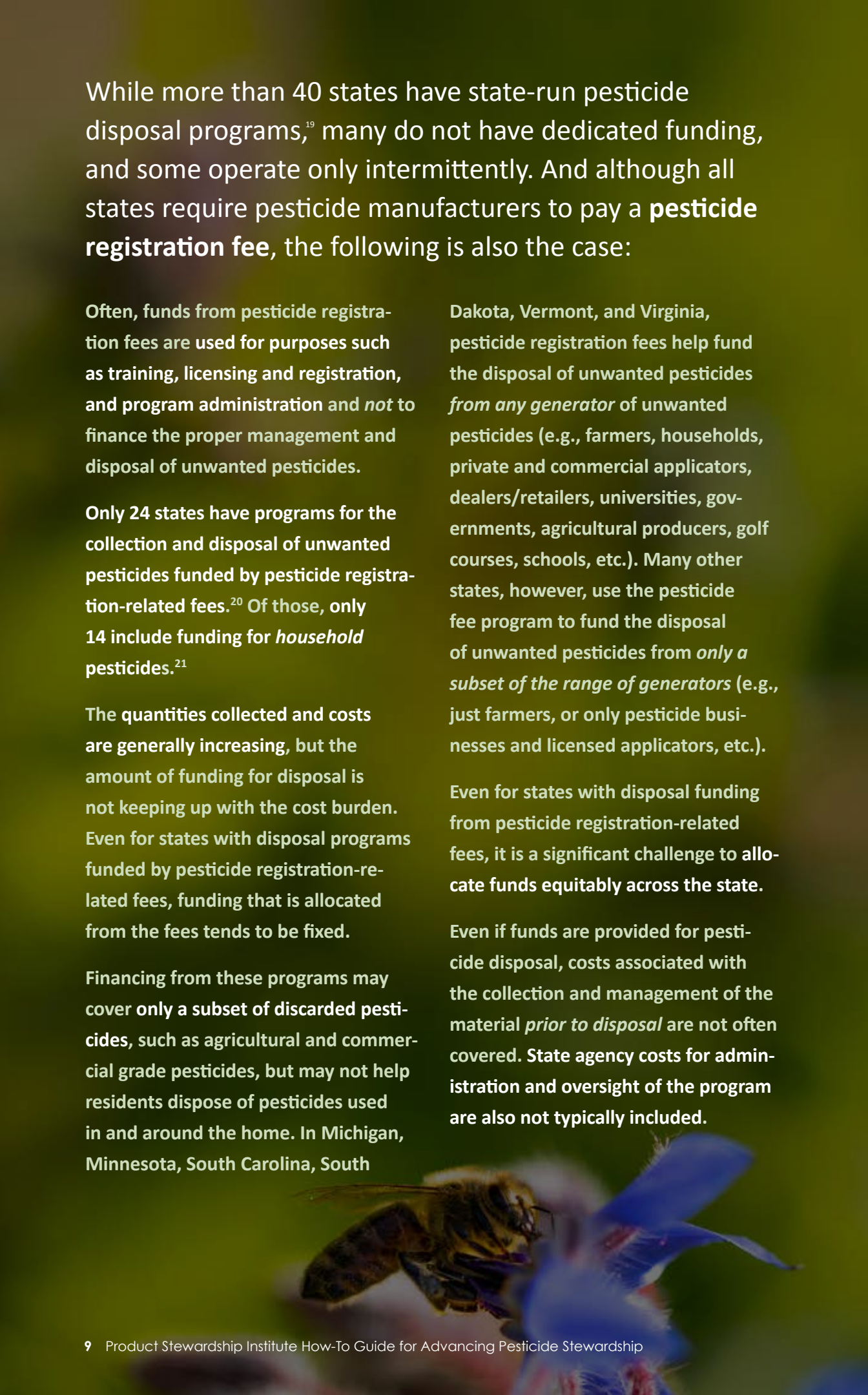
Only 24 states have programs for the collection and disposal of unwanted pesticides funded by pesticide registration-related fees.[20] Of those, **only 14 include funding for *household* pesticides.**[21]

The **quantities collected and costs are generally increasing**, but the amount of funding for disposal is not keeping up with the cost burden. Even for states with disposal programs funded by pesticide registration-related fees, funding that is allocated from the fees tends to be fixed.

Financing from these programs may cover **only a subset of discarded pesticides**, such as agricultural and commercial grade pesticides, but may not help residents dispose of pesticides used in and around the home. In Michigan, Minnesota, South Carolina, South Dakota, Vermont, and Virginia, pesticide registration fees help fund the disposal of unwanted pesticides *from any generator* of unwanted pesticides (e.g., farmers, households, private and commercial applicators, dealers/retailers, universities, governments, agricultural producers, golf courses, schools, etc.). Many other states, however, use the pesticide fee program to fund the disposal of unwanted pesticides from *only a subset of the range of generators* (e.g., just farmers, or only pesticide businesses and licensed applicators, etc.).

Even for states with disposal funding from pesticide registration-related fees, it is a significant challenge to **allocate funds equitably across the state.**

Even if funds are provided for pesticide disposal, costs associated with the collection and management of the material *prior to disposal* are not often covered. **State agency costs for administration and oversight of the program are also not typically included.**



Funding dedicated to pesticide end-of-life management is key to enabling a larger and more convenient collection infrastructure and greater outreach and education—which, in turn, can increase collection while reducing the generation, improper storage, and disposal of unwanted pesticides and containers.

The U.S. EPA notes in its 2001 Clean Sweep Report that *"Permanent funding has many advantages. The 21 states with permanent funding have collected over 70 percent of all the waste pesticides collected nationwide. The principal advantage of permanent funding is that program managers tend to have predictable funds every year or every few years, and can devote their energy to program implementation. With permanent funding, managers can think long-term, can plan for phased state-wide collections, and can establish long-term, rather than short-term contracts with waste haulers."*[22]

Funding dedicated to pesticide end-of-life management is key to enabling a larger and more convenient collection infrastructure and greater outreach and education—which, in turn, can increase collection while reducing the generation, improper storage, and disposal of unwanted pesticides and containers.

Lack of Comprehensive Data

There is a notable lack of current, comprehensive data to quantify the problems of pesticide management and establish a quantitative basis to gauge and improve program performance.

The most recent report that provided pesticide disposal data for all 50 states was issued by the U.S. EPA almost 20 years ago.[23] This report indicates an average state collection rate of approximately 34,800 pounds per year from 1986 to 2001.

In comparison, a conservative estimate of a recent five-year period suggests that the average state pesticide collection rate has grown to about three times that rate: an estimated 104,300 pounds per year, with 23 states collectively managing over 12 million pounds of unwanted pesticides at a cost of over $16 million.[24]

Without robust and continuous data collection, there is an insufficient basis to understand and compare how state programs are performing over time. Data is needed to **evaluate program performance** and trends in generation rate and costs, and also provide a systematic means to **identify where improvements should be made** to make a program more effective and efficient. Although some states produce annual reports, even these have not been produced consistently.

In addition, to provide better estimates of the cost to collect all pesticides and containers generated, it would be helpful to have data that includes: the average amount of pesticides collected per participant and by generator type; percent of purchased pesticides that need to be discarded as waste; and the estimated magnitude of stockpiled pesticides. Quantifying the different sources of pesticides and containers can also help identify underserved populations and the need for more effective outreach, education, and funding.

4. How Can We Improve Pesticide Stewardship in the U.S.?

What are the Goals of Pesticide Stewardship?

To be successful and sustainable, a pesticide stewardship program must provide convenient collection for everyone in the state, ensure adequate and sustainable funding, increase consumer awareness, and collect and use data on an ongoing basis to evaluate and improve program performance.

Convenient Collection

Convenient collection is the foundation of an effective statewide program to increase the collection and safe management of unwanted pesticides.

Convenience standards ensure that consumers receive a minimum level of convenient access to qualified collection services for the target products.

To be considered convenient, the pesticide stewardship program should:

1. Provide free, continuous, and accessible statewide opportunities to collect unwanted pesticides and containers from any person in the state;

2. Accept all unwanted pesticides and containers, regardless of brand or source (e.g., agricultural, household, etc.); and

3. Meet a convenience standard (accessibility metric) that is designed to serve both urban and rural areas. A convenience standard helps to ensure fair and adequate access across the state. An objective, measurable minimum convenience standard can be defined (e.g., number of collection sites required within a geographic area and/or per population served). For example:

- ✓ One permanent collection site in each county with one-day events to supplement, or
- ✓ One permanent collection site within a 15-mile radius for 95% of residents, and one additional site for every 30,000 residents in densely populated areas

To make a convenient collection system effective, sustainable funding and increased education and awareness of both the problem posed by unwanted pesticides and collection options are essential.

Sustainable Funding

Producers must ensure that adequate funding is provided to fully implement the pesticide stewardship program, including the management of historical products no longer sold or where the original brand owner is out of business.

Unless pesticide management programs have an ongoing and consistent source of funding, and fund all reasonable program costs, the program will not be sustainable.

Funding is considered sustainable if it covers the following program costs:

1. Collection (including labor, equipment, reasonable overhead costs, and supplies), transportation, and disposal;

2. Education and outreach/promotion;

3. Administration; and

4. State oversight and enforcement.

As explained in Section 3, government funding is not reliable and voluntary industry contributions result in "free riders." Therefore, the only sustainable source of funding for pesticide stewardship is through a legislated system that requires all pesticide manufacturers to cover post-consumer product management costs. Producers may either pay for the safe management of the products they put on the market or pass on an "eco-fee" through the retailer to the consumer (as a visible or invisible charge).

Consumer Awareness

Strong pesticide stewardship programs require manufacturers to fund education and outreach, and evaluate the performance of outreach initiatives.

Many programs also require retailers to provide educational information to consumers. Education and outreach should be adequately funded, evaluated for its effectiveness (possibly by an independent third-party), and should be a core responsibility of those along the supply chain, including retailers and manufacturers.

To be most effective, the pesticide stewardship program must educate consumers about the pesticide collection opportunities available to them, the reduction of pesticide use, and the use of safer products when available. At a minimum, the program should: 1) notify the public that there is a free collection program; 2) indicate collection locations; and 3) include educational materials, provided by producers, that retailers can use to promote the program to consumers.

Data Collection, Tracking, and Use

To support the improvement and continuing effectiveness of the program overall, establish an ongoing and systematic basis for evaluation of program performance that includes:

1. **Measurable performance goal(s) or indicators** developed to evaluate program effectiveness. Such goals could include collection quantities or a rate, a recycling rate (for containers), reuse quantities or rate, participation rate (or serving a certain percentage of the population), consumer awareness levels, or other goals to be reached by the program; and

2. **Annual reporting** to the state agency on program activities and performance. Reporting requirements often include program performance data; a description of program activities and outcomes; an evaluation of the funding mechanism, funding adequacy, and education and outreach initiatives; an independent audit; and recommendations to improve the program.[27]

Education should focus on the following key messages:[25]

Reduce Waste and Use Safer Alternatives

Pesticide consumers should be educated on the need to reduce the over-purchase of pesticides, which leads to unnecessary waste.

Effective messages focus on estimating appropriate quantities, purchasing only what is needed, proper storage, and appropriate use to prevent excess waste pesticide generation.

The U.S. EPA has developed a Design for the Environment certification and labeling system for pesticides to help consumers and commercial buyers identify products with safer chemical ingredients.[26]

Information about alternative approaches to pest management often emphasize that consumers can **save money *and* protect human health and the environment**. Integrated pest management (IPM) focuses on pest prevention and use of pesticides only as needed—in contrast to traditional pest control involving routine pesticide application. IPM reduces the number of pests and pesticide applications while both saving money and protecting human health. In Maine, state agencies involved in the regulation or use of pesticides are required by law to promote IPM and other methods to minimize reliance on pesticides.

Use Available Collection Sites

Pesticide manufacturers and retailers can play a significant role in providing information about existing pesticide collection programs in stores where pesticides are sold. The more aware participants are of where to safely dispose of waste and the easier (more convenient) it is to do so, the more such disposal will take place.

Decrease Health and Environmental Risks

Program education should include information about the health, safety, and environmental risks of inappropriate disposal, as well as stockpiling. Education on the health and environmental dangers of discarded pesticides and risks to family, friends, and pets, as well as messaging on reducing liability associated with storing hazardous materials (e.g., groundwater contamination, clean-up costs, legal liability, and disposal costs) are likely to increase collection and safe disposal of these materials.

Policy Options for Your State

An increasing number of PSI's state and local government members support a product stewardship approach for a range of consumer products, and pesticides are no exception.

Product stewardship programs are commonly understood to be those that have either of the following features:

1. Industry-funded and government-managed; or

2. Industry-funded or consumer-funded, and industry-managed.

Product stewardship programs provide continuity of sustainable funding and operation, regardless of changes to the political or economic landscape, and require funding to be provided by the manufacturer and/or consumer (rather than the taxpayer). As a result, a product's price will more fully reflects its total lifecycle cost, including the cost of avoiding environmental externalities (e.g., pollution), which are not currently incorporated into the price of pesticides.

There are two primary approaches that states can take to make their pesticide stewardship programs sustainable[28] and more effective:

1. **Improve the existing government-managed system in place under state pesticide laws**, which in some states currently provide partial industry funding for a pesticide and container collection and disposal system. Such improvements would include providing adequate industry or consumer funding for stewardship programs.

2. **Pursue and establish extended producer responsibility (EPR) legislation**, which requires industry to fund and manage the pesticide stewardship program with government oversight.[29]

Because individual states differ in their current programs, the options and implications of the pesticide stewardship choices that they pursue will vary. These options are explored below in more detail and summarized in Figure 1.

While not generally considered product stewardship, some states run successful government-funded and managed programs that have provided significant levels of funding on an ongoing basis. For example, Iowa's program has operated for more than 20 years and has several key elements of strong pesticide disposal programs such as convenient collection and annual reporting. The legislature provides funding through the Groundwater Protection Act and supports permanent facilities open year-round that provide service in 95 out of 99 counties.

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States that currently partially fund pesticide and container disposal through the pesticide registration or related industry fees can follow one of the paths below to make their pesticide stewardship programs more sustainable and effective:

1. Enhance the existing government-managed system so that there is adequate, sustainable industry funding, as well as convenient collection and other program benefits further described below. This may be achieved through legislative, regulatory, or policy changes.

2. Replace the existing government-managed, partially industry-funded system with EPR legislation. This could be carried out by amending the current pesticide law to include EPR provisions or passing a new, separate piece of legislation. Pesticide stewardship program funds would now come from the EPR program rather than the existing state pesticide law.

3. Improve the existing government-managed system under state pesticide laws for *non-household* pesticides and containers ***and*** complement this system with EPR legislation for *household* pesticides and containers. If the existing law currently provides funding to dispose of household pesticides, pesticide stewardship program funds for household pesticides would now come from the EPR program rather than the existing state pesticide law.

States with no existing industry funding for pesticide and container disposal can consider the following options to advance their programs:

1. Enhance the existing government-managed system so that there is adequate, sustainable industry funding, as well as convenient collection and other program benefits further described below. This may be achieved through legislative, regulatory, or policy changes.

2. Employ an EPR legislative approach to develop or improve pesticide stewardship programs. This could be carried out by amending the current pesticide law to include EPR provisions or passing a new, separate piece of legislation.

3. Improve the existing government-managed system under state pesticide laws for *non-household* pesticides and containers and complement this system with EPR legislation for *household* pesticides and containers. Pesticide stewardship program funds for household pesticides would come from EPR. For all other pesticides, these industry funds would come from an enhanced version of the existing state pesticide law.

Figure 1. Policy Options for Pesticide Stewardship

	Approach 1 – Improve Existing ystem	Approach 2*– Establish EPR System
States with existing pesticide laws that partially fund pesticide/ container disposal through industry fees	**Improve the existing government-managed system to provide:** Adequate funding Collection convenience Other program benefits	**Amend existing law/ regulations/policy or pass new EPR law to:** Replace existing disposal funding mechanism with EPR Establish industry-managed program Provide adequate funding, collection convenience, + other program benefits
States with no existing industry funding for pesticide/ container disposal	**Improve the existing government-managed system to provide:** Adequate funding Collection convenience Other program benefits	**Add EPR to existing law or pass new EPR law to:** Establish industry funded + managed program Provide adequate funding, collection convenience, + other program benefits

**EPR requirements can apply to unwanted household pesticides only or all unwanted pesticides.*

Improving the Existing Government-Managed Pesticide Stewardship System

The best way to improve an existing management system for unwanted pesticides and pesticide containers is to enhance it with **best practices from the most effective programs**.

The following key elements, many of which are in place in some of the strongest programs in the U.S.,[30] are recommended to achieve effective and sustainable pesticide stewardship programs:

1. **Require that pesticide registration fees:**

✓ Provide continuous, annual funding for:
- pesticide disposal from all types of generators (farmers, households, landscapers, etc.);
- education and outreach on safe pesticide disposal (and allocation of funding specifically for education and outreach);[31]
- data collection and tracking;
- collection and handling of unwanted pesticides (in addition to disposal); and
- state oversight and administration.

✓ Ensure the fee is adequate and flexible to provide sustainable funding. The fee should accommodate fluctuations of unwanted pesticide and container generation rates over time (e.g., establish a fee basis that is based on sales and toxicity, and not a flat fee per product).

2. **Ensure collection convenience** that:

✓ Accepts all unwanted pesticides from all generators;

✓ Meets an objective, measurable minimum convenience standard;

✓ Incorporates permanent collections in addition to hosting collection events;

✓ Is established in collaboration with local HHW programs;

✓ Incorporates the use of a variety of collection locations (e.g., agricultural dealers/retailers, state Department of Transportation sites, and fire stations);

- ✓ Includes state government representatives on-site for collection events to build relationships and trust with local governments and participants, provide outreach and technical assistance, and control costs/product scope accepted by contractor;
- ✓ Solicits feedback from participants at collection sites to improve program performance.

3. **Require retailers/dealers to provide outreach** and education materials to customers.

4. Establish **performance measures** to evaluate program effectiveness.[32]

5. **Require annual reports** that provide information that can be used to evaluate program performance.

6. Promote strong **intra-state (agriculture and environmental agencies) and state and local government collaboration**, as well as community support. These partnerships can be very helpful, increasing efficiencies in collection, disposal, and education, and allowing small volumes of business/agricultural products to be collected by permanent HHW facilities throughout the year as opposed to less frequent collections (e.g., annual or semi-annual). In some cases, state pesticide disposal programs have helped spur the development of local HHW programs where none previously existed.

7. **Leverage partnerships** with industry, government, multi-stakeholder, and regional groups to help with outreach and education as well as technical assistance. Make use of **regional or national collaboration and networking opportunities** such as conferences and trade or professional associations (including The Pesticide Stewardship Alliance) to share best practices and collaborate on initiatives. Regional recycling associations and university cooperative extensions have also been valuable partners in education and outreach.

8. Participate in the ACRC's agricultural **pesticide container stewardship program**.

9. Implement **disposal bans** that require that no person shall knowingly dispose of unwanted pesticides or containers in a solid waste landfill or down the drain, or burn or illegally dump these materials.

Extended Producer Responsibility: What are the Benefits and How Does it Work?

Improving the existing government-managed pesticide stewardship system as outlined above may be the most viable way for a state to make existing pesticide and container collection, recycling, and disposal programs more sustainable and successful.

However, for states that do not currently use pesticide registration fees to fund unwanted pesticide and container collection and disposal, implementing EPR for all unwanted pesticide and containers may be a less complicated option than for those states whose unwanted pesticide management programs are currently funded by pesticide registration fees.

Furthermore, EPR can offer other benefits that may not be possible through enhancement of the pesticide registration fee system, including:

1. An approach where producers have flexibility to design the product management system and public education programs to meet the performance goals established or approved by government, with minimum government involvement; and

2. Consistency and efficiency—EPR, when implemented similarly across states, can provide consistent and harmonized programs that can drive efficiencies and cost savings.

Results of EPR Laws in the U.S.

EPR laws have been **proven effective at spurring substantial increases in collection, recycling, and safe disposal** of a variety of products, particularly when the legislation includes performance goals, collection convenience standards, and education and outreach.

EPR laws have also provided sustainable funding and created jobs in many states across the U.S. For example, EPR programs for electronics, mercury thermostats, paint, and mattresses in Connecticut have achieved the following:[33]

- ✓ Provided nearly all Connecticut residents with **convenient access to collection sites**;
- ✓ Yielded a cumulative **cost savings of more than $2.6 million per year** to local governments;
- ✓ Led to the creation of **more than 100 jobs**; and
- ✓ Diverted more than **26 million pounds of materials** from waste.

There are more than a hundred EPR laws in the U.S. in 33 states and Washington DC for 14 types of products (such as batteries, carpet, electronics, mattresses, mercury thermostats and lamps, paint, and pharmaceuticals). HHW EPR **bills that include pesticides have been introduced** in recent years to develop and implement this type of program (most recently in Oregon in 2019—HB 2772/SB 96).

A pesticide container EPR law **in California** requires every producer that registers agricultural- or structural-use (professional application) pesticides for use in California to establish or participate in a recycling program for HDPE pesticide containers of 55 gallons or less. It is the only law of its kind in the U.S. and operates with sustainable funding from pesticide producers, although it does not include household pesticide containers. This California legislation was designed to reinforce ACRC's industry-led voluntary effort to recycle HDPE pesticide containers.

Like California's law, the ACRC program is funded by pesticide producers, but does not include household pesticide containers. Although **ACRC's voluntary program** operates in 44 states with more than 5,000 collection sites[34] and has recycled almost 185 million pounds of pesticide containers since 1992,[35] its recycling rate is only 33%[36]—**while California's *legislated* program recycles 50%** of available containers.[37]

Results of EPR Laws in Canada

In Canada, **EPR laws already exist for both pesticides and pesticide containers**.

For **household pesticides**, end-of-life management is mandated in British Columbia, Manitoba, Ontario, and recently Saskatchewan as part of EPR programs for HHW that include other materials such as solvents and flammable materials.[38]

These programs require product manufacturers to establish a collection program and pay for collection and proper disposal of HHW, including household pesticides. In British Columbia, Manitoba, and Ontario, manufacturers currently manage this program through a stewardship organization, Product Care. In addition to residential materials, Ontario's program includes small quantity institutional, commercial, and industrial (IC&I) generators.

EPR for HHW, which includes pesticides, has achieved the following results in Canada:[39]

- ✓ Ontario's program collected almost 86,000 pounds of pesticides in 2015. That's **59% of all the pesticides available for collection in the province.**[40]
- ✓ Manitoba's program **increased HHW collection volumes by 419%** and added **21 new collection sites** in the first five years of the program.
- ✓ In British Columbia, HHW **collection volumes increased by 365% and 74 new collection sites** were added between 2001 and 2017. In addition, the **program generated collection rates over 35% higher than would have been achieved without EPR**.[41]

Unwanted **agricultural pesticides, livestock medications, and pesticide containers** have been managed across Canada by Cleanfarms, a nonprofit industry stewardship organization that operates a voluntary industry-led program for farmers and other users of commercial class pesticides. Cleanfarms allows for the return of pesticides and livestock medication to agricultural retail and municipal waste collection sites for safe disposal free of charge. Cleanfarms funds the program through a fee charged to brand owners on each container sold from its pesticide manufacturer members. Obsolete pesticides and livestock medications are paid through separate levies.

Cleanfarms also operates a primarily voluntary pesticide container collection and recycling program for containers less than 23 Liters (approximately 6 gallons). Approximately 65% of the empty pesticide and fertilizer containers sold in Canada are returned for recycling through the Cleanfarms program.[42] **In Manitoba and Quebec, the Cleanfarms pesticide container program is regulated** with other empty containers under the **Packaging and Printed Paper Stewardship Regulation** in Manitoba and the Regulation Respecting Compensation for Municipal Services Provided to Recover and Reclaim Residual Materials in Quebec. The regulations apply to packaging only whereas the obsolete pesticide and animal health medication collection program is unregulated and operated voluntarily.

Model Elements of EPR Legislation

EPR programs typically allow for manufacturers to join a stewardship organization, which submits a written plan for approval to the state oversight agency on behalf of the manufacturers. The plan describes in detail how the manufacturers will provide for the statewide collection and safe management of their products through the stewardship organization.

The plan must show how the pesticide manufacturers will meet a convenience standard established through the legislation, fund the program, provide adequate education and outreach, and commit to annual reporting to the state oversight agency, among other requirements.

Based on PSI's experience in developing EPR legislation for the past two decades, there are about 20 key elements in any EPR model bill. Beyond provisions for **convenient collection, sustainable financing, consumer awareness, and comprehensive data** already described above, the following additional EPR elements are among the most important and provide a sense for how these programs operate:

1. **Scope of Products:** Types of materials included and excluded in the bill (e.g., household pesticides, commercial pesticides, pesticide containers, etc.)

2. **Covered Entities:** Sources of unwanted products that may use the producer funded program (e.g., households, agricultural businesses, nonagricultural businesses, governments, etc.)

3. **Producer/Responsible Party:** Identifies and defines which participants in the supply chain are responsible for meeting specific requirements. Participation may be required for the manufacturer, marketer, brand owner, first importer, and/or retailer.

4. **Stewardship Organization:** Outlines how producers/responsible parties may comply with the law (i.e., whether they can join a representative organization or create and implement their own individual plan). The stewardship organization will often be the vehicle through which the producers manage and finance product collection and safe management.

5. **Stewardship Plan:** Developed by producers/responsible parties, or their representative organization, to lay out how the program will ensure consumer convenience, meet performance goals, provide effective education and outreach, fund the program, and adequately perform other operational aspects of the program.[43]

6. **Administrative fees:** Includes the amount of money to be paid to the state agency annually to provide oversight of the program.

7. **Penalties for Violation:** Includes provisions for enforcement penalties against producers/responsible parties in violation of the law. Provisions to ensure compliance must be included to ensure a level playing field. In many cases, retailers cannot sell products from non-compliant manufacturers.

8. **Disposal Ban:** Establish a disposal ban that requires that no person shall knowingly dispose of the covered products (unwanted pesticides or containers) in a solid waste landfill or down the drain, or burn or illegally dump these materials.

Lay the Groundwork for Change

Whether you are taking steps to improve the pesticide registration fee system to advance pesticide stewardship, considering implementing EPR, or thinking about following an interim approach (e.g., improving the fee program in the short-term while laying the groundwork for EPR legislation in the long-term), these strategies will help you establish the foundation to significantly improve pesticide stewardship:

1. **Develop the Capacity to Implement Change:**

a. Compile data to establish a quantitative baseline of what, and how much, is currently being generated and collected. Include recent historical data (e.g., the past five years) to identify trends in unwanted pesticide and container generation.

b. Develop fact sheets that highlight the current situation (using quantitative data compiled above), the benefits of EPR and how it works, and how to improve the Pesticide Registration Fee funding model. These fact sheets can be used to help educate state and local government representatives, legislators, and other stakeholders.

c. Develop counterarguments to anticipate opposition or barriers that might be raised.

2. **Build Coalitions:** Generate support for change by bringing together stakeholders, including state and local governments, retailers, waste management companies, applicators, and others, to discuss and educate on policy and other solutions to the current problems of unwanted pesticide management. Identify and support champions within the stakeholder group.

3. **Begin to Shift the Context:** Adopt supporting policies in businesses, municipalities, and at the state level.

a. Ban burning of pesticide containers and landfill or drain disposal of household and other pesticides.

b. Establish local ordinances that require pesticide manufacturers and retailers to provide information about existing pesticide and container collection programs in stores where pesticides are sold.

c. Establish Integrated Pest Management policies at the local and state level to encourage use of less harmful alternatives.

d. Provide financial incentives or establish procurement policies for the purchase of less harmful alternatives.

4. **Enhance Policy Design:** Develop supportive initiatives to help understand the successes and challenges of different aspects and approaches to potential solutions. For example, conduct pilot projects that would test:

a. The effectiveness of a variety of education and outreach materials and strategies; or

b. The use of different types of collection infrastructure (e.g., retailers, HHW facilities, DOT locations, events, etc.)

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Persons with disabilities who require alternatively formatted materials or other special accommodations to ensure effective communication and access to this project should contact Amanda Nicholson at amanda@productstewardship.us. Please allow at least 10 business days to arrange for accommodations.

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2 Michigan Department of Agriculture & Rural Development, 2018, Annual Report accessed on July 20, 2019 from https://www.michigan.gov/documents/mdard/Annual_Report_ESD_FY18_MAEAP_Clean_Sweep_653500_7.pdf.

3 Financial and Business Assistance Section Staff, Iowa Department of Natural Resources, via email on July 22, 2019.

4 Even EPA's definition of pesticide stewardship, which does not include end-of-life management, also reflects a lack of consideration for unwanted pesticides. In contrast, The Pesticide Stewardship Alliance, a national multi-stakeholder partnership, defines pesticide stewardship as *"any activity that has a positive impact on the safety and efficacy of pesticides from manufacture, marketing and commerce, through storage and use, and ultimately disposal of unwanted or unusable products and the management of emptied containers."* PSI also defines product stewardship as *"the act of minimizing health, safety, environmental and social impacts, and maximizing economic benefits of a product and its packaging throughout all lifecycle stages."*

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23 United States Environmental Protection Agency, 2002. Clean Sweep Report 2001 Without Appendices: State and Local Government Achievements in Disposal of Agricultural Waste Pesticides. Office of Pesticide Programs, United States Environmental Protection Agency, Washington, DC. EPA 735-R-02-001, May 2002.

24 This data was collected by the Product Stewardship Institute as part of research for this project. These totals reflect amounts collected and costs incurred primarily in the most recent five-year period for which data was available for these states: in some cases, from 2014 to 2018; in other cases, 2013-2017; and in still other cases, only the last year or three years of data provided, or an estimate of the average pounds per year was developed from total collected over the time period of the program. Data tends to reflect a minimum of what is generated and the associated costs incurred, as some state data only includes household pesticides, some only non-household pesticides, some only from farmers and residents, and some only from farmers. Costs sometimes include advertising, contractor, and disposal, sometimes disposal only. Often no overhead costs are included for the state agency or local governments.

25 Messaging should include information on best practices for use, storage, and disposal as well as recycling of empty containers. Safely using, storing, and disposing of pesticide products reduces risks to public health and the environment and can also prevent unnecessary waste generation. These best practices can be found from a range of resources, including those from the National Pesticide Information Center, the US EPA (Citizen's Guide to Pest Control and Pesticide Safety and Safe Disposal of Pesticides), and a variety of state and local government agencies. PSI's Pesticide Stewardship Briefing Document also provides a consolidated list of best practices for use, storage, and disposal of unwanted pesticides.

26 The GlobalG.A.P. (Good Agricultural Practices) voluntary best practices certification program, which includes periodic inspections, has also been credited with increasing the cleanout of unwanted agricultural pesticides stockpiled in storage areas.

27 Examples of annual reports for Canadian EPR for HHW programs that include pesticides can be found on Product Care's Annual Report web site.

28 For programs to be effective and sustainable, those who design, manufacture, sell, and use pesticide products need to take responsibility for reducing negative impacts to the economy, environment, public health, and worker safety. Manufacturers that design products and specify packaging have the greatest ability, and therefore greatest responsibility, to reduce these impacts by attempting to incorporate the full lifecycle costs into the cost of doing business. Manufacturers have the most knowledge of the hazardous materials contained in a product and have the power to reduce the hazard at its source. However, other stakeholders, such as suppliers, retailers, and consumers, also play an important role in education and outreach, and collection of unwanted pesticides. Governments for example, have responsibility for oversight and ensuring a level playing field for manufacturers.

29 Extended producer responsibility (EPR), a mandatory type of product stewardship that includes, at a minimum, the requirement that the producer's responsibility for their product extends to post-consumer management of that product and its packaging. EPR policy: (1) shifts financial and management responsibility, with government oversight, upstream to the producer and away from the public sector; and (2) provides incentives to producers to incorporate environmental considerations into product and packaging design.

30 Such as those in Minnesota, North Carolina, Vermont, Virginia, and Wisconsin.

31 For example, Vermont law stipulates that five dollars from each pesticide product registration fee shall be used for an educational program related to the proper purchase, application, and disposal of household pesticides. Also, some programs conduct exit surveys of participants at collection locations to understand their experience with the program, its convenience, and other aspects to help with its improvement.

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43 Examples of stewardship program plans for Canadian EPR for HHW programs that include pesticides can be found on Product Care's Stewardship Plan web page.