Financing the Disposal of Unwanted Agricultural Pesticides

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Abstract: Since the mid 1980s, it has been recognized that significant quantities of unwanted pesticides are being retained by agricultural producers in barns and other out buildings throughout the United States. State governments have responded to the hazards posed by these pesticides by implementing programs to collect and dispose of them. This paper reviews issues related to costs and funding of pesticide collection and disposal programs. Primary and secondary information on states' approaches to and experiences with unwanted pesticide removal is presented. Differences in the theoretical impacts of various collection funding methods on reducing unwanted pesticide stocks and allocating disposal costs are discussed.

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Since the mid 1980s, it has been recognized that significant quantities of unwanted pesticides are being retained by agricultural producers in barns and other out buildings throughout our Country. Some of these unwanted pesticides are pesticides whose registrations were canceled or suspended by the Environmental Protection Agency (EPA). Other unwanted pesticides were not used because they were replaced by superior products. In some instances, producers changed crops or went with a pesticide contractor and thus did not consume existing stocks. The Great Lakes regional EPA office estimated that more than 13 million pounds of pesticides were stored in the six states of that region (Jones).

Governments at all levels have expressed an interest in dealing with the potential problem posed by stocks of unused pesticides. The EPA enacted a Universal Waste Rule to ease the requirements for the safe disposal of unwanted pesticides and other common hazardous wastes (*Code of Federal Regulations*). Many states have developed a framework regulating the disposal of hazardous wastes through household and permanent hazardous waste programs. An additional development at the state level has been an agricultural pesticide disposal program to provide a viable disposal option for unwanted pesticides. Nearly every state has initiated a special agricultural pesticide collection program to provide for the safe disposal of accumulated pesticides, and nearly 10 million pounds of unwanted pesticides have been collected.

One impediment to the disposal of pesticides is cost. The lawful disposal of unwanted pesticides pursuant to the Resource Conversation and Recovery Act (RCRA) is expensive (*U.S. Code*). Many persons have stored unwanted pesticides due to their unwillingness to pay for their disposal. For governments, the funding of pesticide collection programs is a limiting factor for

the efforts provided by many states. Costs for early pesticide collection programs in the Great Lakes Basin were approximately $4 per pound (Jones). For its 1994-95 collection costs, Illinois reported spending $4.07 per pound (Beaver).

Given the problem with funding, our paper explores major options employed by states to fund their programs. The initial inquiry concerns the federal requirements for pesticide disposal that reveals a costly infrastructure. States have responded with five funding options, with financing from state pesticide registration fees being the most significant. Consideration of these options suggests that states will need to use their particular demographics and other hazardous waste efforts to decide how best to address this environmental issue.

Costs of Disposing of Pesticides

When pesticides are abandoned or disposed of, rather than used for their intended purposes, they are hazardous wastes. Abandoned pesticides must be handled under federal hazardous waste provisions. Besides costs of disposal, pesticide collection programs may incur special expenses due to the type or condition of material or container. Aggregate disposal costs raise questions concerning who should pay for the disposal of unwanted pesticides. This section addresses the federal disposal requirements and pesticide disposal costs as a background for evaluating funding options.

Several special expenses raise questions about who should pay for the disposal of certain unwanted pesticides. Should owners of particularly dangerous pesticides such as dioxins pay more due to higher disposal costs? Who should pay the testing costs for an unknown pesticide? Should there be a fee for on-site pickups or handling of pesticides in deteriorated containers? Not all pesticides cost the same to dispose of safely, and the disposal of some banned pesticides has

involved significant costs. Overall, states have not attempted to recapture these expenses through participant charges.

Given the age and storage conditions of unwanted pesticides, some pesticide containers have lost their labels and their contents are unknown. Testing unknown materials can be expensive. Should these costs be absorbed by the collection program or should the owner help pay for testing? Because the focus of a collection program is to remove the threat posed by unwanted dangerous materials, unknown materials need to be collected and disposed of safely.

A similar situation exists for the on-site pickup of deteriorated containers. A collection program must take the necessary precaution to operate safely and avoid accidents. Pesticides in containers that have deteriorated pose singular risks of a type that collection programs are meant to address. If safety requires the pickup of deteriorated containers, this is a necessary expense of the disposal of unwanted pesticides. While a fee could be assigned to safety inspections and on-site collections, states have absorbed the expenses of these measures as part of the cost of removing stored pesticides.

Funding Options

Our survey of state pesticide collection efforts revealed that nearly one-half of the states have passed special legislation or a designated state agency has enacted administrative regulations governing this issue. A ranking of the states by amounts collected and notation of legislation or regulations fails to show a correlation that would recommend legislative or administrative action. Rather, the survey information seems to suggest that the major constraint on pesticide collection programs is funding. An analysis of funding provisions for pesticide collection programs shows five different categories of financial resources: (1) grants, (2) user fees, (3) pesticide registration

fees, (4) taxing the sale of pesticides, and (5) surcharges or site taxes. Some states employ more than one of these categories, as the use of one of these funding sources does not preclude the use of another.

***Grants*:** Some states have not assessed any charges against participants, relying on federal and state monies to cover program costs. Grants for pesticide collection programs have come from the EPA pursuant to programs under the Clean Water Act, the Federal Insecticide, Fungicide and Rodenticide Act, and the Resource Conservation and Recovery Act. In other cases, states have made special appropriations from general funds for collection programs. These appropriations are often similar to grants in that they provide one-time or temporary funding for collection programs. Funding through grants does not provide a basis for a pragmatic long-term response to the issue of the safe disposal of unwanted pesticides due to the continued generation of such materials.

***User Fees*:** An objective of some states is to have persons who own unwanted pesticides help pay disposal costs through user fees. By adopting user fees, the pesticide disposal program does not foster dependence on governmental benevolence for an expense connected with private business activities. Conflicting concerns confront a user fee requirement. While user fees can force participants to assume some responsibility for their unwanted pesticides, there is no indication that such is needed. Conversely, persons owning unwanted pesticides may be less likely to participate when there is a fee. From an economic perspective, user fees may involve an inordinate amount of effort to raise insignificant sums. Since user fees often do not cover the costs of disposal, provisions for other sources of funds will be required.

***Pesticide Registration Fees*:** A prevalent financing provision for states with established agricultural pesticide programs is to use pesticide registration monies for collection programs.

Some states specifically allocate part of the registration fee to cleanup and collection programs.

***Taxing Pesticides Sold*:** Another funding possibility is a tax on pesticide products. Michigan has adopted a detailed funding program that involves both registration monies and a tax on pesticides sold (*Michigan Compiled Laws Annotated*). Monies may be deposited into a fund to be used for numerous purposes.

***Surcharges or Site Taxes*:** Household hazardous waste programs show alternative surcharges and site taxes as a means to help fund the collection of pesticides. The funds raised from a site tax would be used with other funds to pay for the cost of land, labor, equipment, and services needed for the operation of the hazardous waste facility.

Efficiency and Equity Characteristics of Funding Sources

The funding methods differ in their efficiency and equity characteristics with respect to voluntary disposal programs for unwanted stored pesticides. These differences are summarized in table 1 which rates equity and efficiency characteristics for each type of funding for two objectives: the disposal of existing pesticide stocks and the disposal of pesticide stocks that may be accumulated in the future. The equity rating is concerned with the degree to which the cost of disposal is borne by owners of unwanted stocks. The potential efficiency rating is concerned with the potential of a funding strategy to result in the "complete" disposal of stocks of unwanted stored pesticides.

Equity ratings in table 1 range from lowest equity (1) to highest (3). An equity rating of 1 indicates that there is no linkage between the source of disposal funds and the ownership of unwanted stored pesticides. An equity rating of 2 indicates a partial linkage between ownership and disposal cost, and an equity ranking of 3 indicates that a high percentage of disposal cost is

borne by the owner of unwanted stored pesticides.

Potential efficiency indices in table 1 range from lowest efficiency (1) to highest (3). A ranking of 1 indicates that the funding method provides a disincentive to pesticide disposal in a voluntary program. An efficiency index of 2 indicates the absence of a disposal disincentive associated with the funding method. An efficiency index of 3 indicates both the absence of funding related disposal disincentives and the existence of incentives to reduce pesticide use. Reducing pesticide use may lessen future disposal problems by reducing the quantities of pesticides purchased.

Because the ability of a program to effect the complete disposal of unwanted pesticides is influenced by more than the source of funding, table 1 considers the *potential* efficiency of each funding method. The level of disposal that is attained will be affected by both the size of the pool of disposal funds and the specific characteristics of the disposal program. Additionally, if participation in a disposal program is voluntary, the degree of disposal attained by any program will depend on characteristics of owners of unwanted pesticides. Some pesticide owners may want to be rid of stored pesticides to the extent that they would be willing to pay some or all of the costs of disposal. Other owners may choose not to participate, even in a no-fee disposal program, simply to avoid transactions costs (*e.g.*, time, paperwork) associated with the program.

The disposal of existing stocks of unwanted pesticides is distinguished from the disposal of future pesticide stocks in table 1 due to possible effects of the disposal funding source on pesticide accumulation. Since existing stocks are already in place, their accumulation cannot be affected by the funding method used for a disposal program. The method of funding may, however, affect future pesticide use, accumulation, and disposal costs. The highest efficiency rating for disposal of existing stocks is therefore 2, since the source of funding cannot affect

accumulation of existing stocks. An efficiency rating of 3 is possible for the objective of eliminating future unwanted stocks, since the funding method may affect future accumulation as well as future disposal.

State or federal grants for the disposal of unwanted pesticide stocks were assigned efficiency and equity ratings of 2 and 1, respectively, for both existing and future stock disposal. The efficiency rating of 2 for existing stocks reflects the fact that grant funding imposes no disincentives for disposal. The efficiency rating for grants is also 2 for future disposal because grant funding provides no incentives to reduce future pesticide use. The equity rating of 1 for both existing and future disposal under grant funding reflects the fact that grant funding is supported by unspecified sources of state or federal dollars and is unrelated to ownership of unwanted pesticides. A reliance on grants to fund pesticide disposal also raises questions about sustainability of the disposal program over time, as this is not a continuous method of raising funds, but is subject to periodic funding decisions by state or federal governments.

The use of user fees to finance disposal merits a 3 rating for equity in the disposal of both existing and future pesticide stocks, because user fees are imposed directly on the owners of these stocks. The efficiency rating of user fee financing is 1 for both existing and future stocks, however, because the user fee creates a financial disincentive for owners of unwanted pesticides to participate in a disposal program. A user fee program for disposal of future stocks may reduce future pesticide use and accumulation, since the user knows he will pay for disposal, but an efficiency rating of 1 was still assigned to user fee programs for future stocks because, in a voluntary program, user fees still provide a disincentive for participation.

Registration fees, imposed on pesticide manufacturers, were assigned an efficiency rating of 2 for disposal of existing stocks because they do not create a barrier to participation. The

efficiency rating increases to 3 for disposal of future stocks, because the increase in pesticide cost may be expected to reduce pesticide usage and serve to reduce future accumulation of unwanted stocks. An equity rating of 1 was assigned to registration funding for disposal of existing stocks, since the funds will come from current and future purchasers of pesticides rather than current owners of unwanted pesticides. The equity rating increases to 2 for disposal of future stocks because future owners of unwanted stocks will be a subset of current and future pesticide purchasers. The equity rating is 2 rather than 3, however, because fees on purchasers who do not accumulate unwanted pesticides will be subsidizing the disposal costs of purchasers who do accumulate these stocks.

Pesticide tax funding for disposal is similar to registration fee funding with respect to incentives for disposal, pesticide accumulation, and distribution of costs. Efficiency and equity ratings for pesticide taxes are thus the same as those for registration fees. It should be noted that both registration fees and pesticide taxes shift part of the disposal costs to pesticide manufacturers, with the distribution of costs to suppliers and demanders of pesticides determined by pesticide supply and demand elasticities (Gunter, Jeong and White).

Site taxes provide funds for disposal by imposing a cost on individuals residing within a specific political boundary. Site taxes were assigned efficiency ratings of 2 for disposal of both existing and future stocks, since they do not create participation disincentives, but neither do they create disincentives for future accumulation. Site taxes were assigned equity ratings of 1 for disposal of both existing and future stocks, since they are based on location rather than on ownership of unwanted pesticides.

Concluding Comments and Implications

The continued storage of unwanted pesticides creates the risk of potential environmental contamination by a natural disaster; a tornado or a flood could cause a stored pesticide to be dispersed into the ground or water. Farm properties sold or inherited often mean that pesticides are passed to persons who have not had training or experience in using them. In many cases, persons possessing or inheriting pesticides lack knowledge of how to dispose of them safely. The hazards created by unwanted pesticides have led states to provide for the collection and proper disposal of unwanted pesticides as a precautionary measure that safeguards citizens and natural resources.

The initiation of a collection program, however, does not guarantee that accumulated pesticides will be disposed of safely. Nor do targeted efforts or one-time collections completely respond to the hazard. Surveys have shown that possessors of unwanted pesticides may be hesitant to submit them at a collection event. If there is a fee for disposal, even fewer owners of pesticides may avail themselves to the governmental collection effort. Thus, states have found that multiple collections over a number of years are necessary to attain the removal of most accumulated stocks of unwanted pesticides. Often, states have actively involved the cooperative extension service to increase participation in the collection efforts. Given differences in population, amounts of accumulated pesticides, dangers posed by unwanted pesticides, and other hazardous waste collection efforts, recommending a single strategy for all states is not possible.

Our research suggests that a state's regulatory framework is not an important indicator of the volume of collected materials. Instead, the availability of funding is more likely to restrain collection efforts so that each state will need to adopt a strategy in view of its resources. The costs of pesticide collection efforts need not be that expensive. If known banned or dangerous pesticides are present in a region or county, a targeted program involving participants registering

their materials before collection may be appropriate. Costs of such a program, including administrative overhead, may be $4 to $6 per pound. Where most of the older more toxic materials have been collected, the cost may be approximately $1.50 to $3 per pound. In view of the new Universal Waste Rule and its relaxed requirements concerning pesticide collections, achieving lower collection costs should be possible. Once states have removed large quantities of stored pesticides, they can probably forego participant registration and move to a relaxed program where costs would be about $1 per pound.

If pesticide collection programs are to remain voluntary, states may want to consider different programs for the disposal of existing and future unwanted pesticide stocks. It may be necessary to give greater weight to efficiency considerations in facilitating the cleanup of existing stocks, since a high rate of participation will be needed to accomplish a high level of disposal. Equity considerations may be given greater emphasis in designing programs to reduce future stocks of unwanted pesticides, since program design may affect accumulation of stocks as well as disposal. Registration fees and pesticide taxes are attractive funding sources for disposal of future stocks since they impose disposal costs on pesticide manufacturers and users, provide disincentives to future pesticide accumulation, and avoid disincentives to participation in collection programs. Although registration fees and pesticide taxes do not restrict disposal cost allocations to owners of future stocks, they do impose the costs on suppliers and users of pesticides rather than on the general public or residents of a specified area. A registration fee/pesticide tax system also has the advantage of providing a continuing source of funds that is related to the level of pesticide use.

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Table 1.
Efficiency and Equity Characteristics of Funding Methods

	Existing Stocks		Future Stocks		
Funding Method	**Potential Efficiency**	**Equity**	**Potential Efficiency**	**Equity**	**Comments**
Grants	2	1	2	1	uncertain sustainability
User fees	1	3	1	3	possible reduction in future accumulation
Registration fees	2	1	3	2	reduced pesticide use
Pesticide tax	2	1	3	2	reduced pesticide use
Site tax	2	1	2	1	

Efficiency ratings: 1 - disincentive for disposal, 2 - no disincentive for disposal, 3 - no disincentive for disposal plus incentive for reduced accumulation.

Equity ratings: 1 - no link between source of funds and ownership of unwanted pesticides, 2 - partial link between ownership and source of funds, 3 - strong link between ownership and source of funds.