The Poweshiek Skipper Project

Position Paper—The Need for Nationwide, Real-Time Pesticide Tracking

Sometime between about 2002 and 2005 populations of *Oarisma poweshiek* disappeared from the landscape of Iowa, Minnesota, and North and South Dakota. This butterfly is a prairie obligate, and is only found in the areas (now quite small) that have native prairie. There are arguments about what caused its demise, but the disappearance coincided with widespread outbreaks of soybean aphids, and the subsequent spraying of broad-spectrum insecticides for that insect cannot be ruled out.

I investigated pesticide use in the areas where the butterfly had been found in an attempt to compare historical usage to the amount used to attempt to control the aphids. I found that about a third of the landscape had been treated for soybean aphids during that time, raising the possibility of vapor drift of insecticides being responsible. I also found that there are serious problems with the way data on pesticide usage is collected in the United States. Those problems make any assumptions about the safety of environmental exposures to pesticides suspect.

The EPA, the Department of Agriculture, and a few other public and private organizations publish information on the use of pesticides in the U. S. That information is limited in scope and badly out-of-date. For example, the most recent "Pesticide Industry Sales and Usage" report on the EPA website today covers the years 2006-2007. Applicators of pesticides are required by law or by best management practice to keep records but no one (with a few state exeptions) collects those records.

Pesticides are widely used in the United States, particularly for intensive agriculture, but also for mosquito control, golf course maintenance, and suburban lawn care. Pesticides are significantly regulated in the United States, and those regulations are fairly effective in preventing occupational illness and death for the users of these highly toxic chemicals. The regulation of pesticides is also effective in reducing the amount of pesticide that would be used minus those rules. However, the use of pesticides in the United States is not properly calibrated, due to the lack of fundamental information about what pesticides were applied, and when and where they were applied. Without that calibration, pesticide use is not as effective as it could be, and ***significant gaps in the information needed to make important public health, safety, and environmental decisions exist.***

A publicly accessible pesticide tracking system can be designed that would make available information about the use of pesticides in real time and integrated with geographical information systems. The system can be designed to minimize the regulatory burden on the users—it would require submittal of information that is already required to be kept. Because of the effectiveness of this type of data collection, some redundant pesticide tracking systems could be eliminated.

The Pesticide Regulatory Scheme

The Environmental Protection Agency (EPA) regulates pesticide under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). Pesticide regulations are found in 40 CFR Subpart E (150-180). Some authority for enforcement of the programs is handed down to the States, generally with the state's Department of Agriculture.

Pesticides are required to be registered, and the manufacturer of that pesticide is also registered. Each pesticide gets a unique EPA ID number. The manufacturer prepares a label for the pesticide, based on extensive studies required by the registration process. That label gives specific instructions for treating certain crops and their target pest organisms. The label instructions become the law for using that chemical—applying the pesticide in a manner that is not in accordance with the label is a violation of the law.

Specific record-keeping is required for applicators of restricted use pesticides. That information is required to be kept for a minimum of two years by Federal law. Information kept includes the product name, product EPA registration number, total amount of pesticide applied, date, location, crop treated, amount of area treated, and the name and certification number of the applicator. States are given authority to regulate pesticides, so some requirements are different between states, but for most states, there is no requirement to report the pesticide application information.

There are other types of pesticide applications that do not have specific record-keeping requirements. For example, in most states a private applicator can apply a non-restricted use pesticide without keeping those specific records. However, that private applicator still needs to comply with the label requirements. If the actions of that applicator result in damage to property or health of another party, that applicator would have to produce similar information in order to defend his actions in court. However, none of that information is generally made available to regulatory agencies, public health agencies, or the public, either before or after the pesticide application, unless there is a specific accident.

The Proposed Requirement

The EPA or a similar agency would be required to develop a system for reporting of pesticide applications. The information submitted to the website would be publicly available in real time in the form of a database. Information could cover a specific time frame, but archive information needs to be kept and made available as well.

Commercial and private applicators would be required to submit information about pesticide applications, preferably a day in advance of the application, but at a minimum within a day after the application. What was applied, who applied it, how much was applied, where was it applied, and other information similar to that required to be kept after the application of a restricted use pesticide would be submitted. Submittal would be by website or could be by a

smartphone app. Geographical Information Systems have become sophisticated in recent years, so the location of the pesticide application should be given with the best accuracy possible.

Calibration versus Regulation

This proposal does add a regulatory requirement for pesticide applicators, so an argument could be made that this increases the regulatory burden on those people. However, the approach is primarily intended to calibrate rather than regulate. The information that is required to be submitted is already required to be developed and kept on file, either by a specific regulation or by best management practices. If that information is already required to be kept, shouldn't it be made available for use in determining pesticide fates and exposures in the environment?

The EPA and State Departments of Agriculture are charged with ensuring that pesticides are used safely and in accordance with the law. ***How can they do that when they cannot determine within a reasonable amount of time what pesticide was applied and where it was applied?***

Current Pesticide Use Tracking Systems

The state of California has a pesticide use reporting requirement, and a long enough history of using their system to work through a number of the issues. The California system, which initiated full reporting of pesticide usage in 1990 requires applicators to submit information to their county agriculture commissioners on a monthly basis, and in turn it is submitted to the state from the agricultural departments. Technology has advanced in two plus decades—real-time submissions directly to a database should be much easier now, and should be the preferred method.

Other states and the EPA have tracking systems that concentrate on point-of-sale. Pesticide use is tracked by polling vendors of pesticides and sometimes geographical information is developed from that. The information generated from point-of-sale tracking relies on assumptions that may or may not reflect actual conditions.

The Department of Agriculture conducts a census and asks farmers about pesticide use on particular crops. The information collected often concentrates on a particular crop and does not query information about others, and is often collected a significant amount of time after the application.

There are organizations which provide information to the public on pesticide usage, and that is a necessary service. However, when the core information is incomplete the compiled information can be misleading. A case in point is the "Consumer Confidence Report" that suppliers of drinking water provide to their customers on an annual basis. That report usually contains a table of chemical contaminants the water department is required to analyze for. The list is from the "Primary Drinking Water Standards" found in the Code of Federal Regulations at

40 CFR 141. The list of 86 contaminates contains slightly more than 50 organic chemical contaminates. The organic chemical list contains industrial chemicals and 21 pesticides. Of those pesticides, some are currently in use, and some have been banned for a long time. Diquat was banned in 1979, chlordane was generally restricted in 1983 and banned in 1988, and endrin was banned in 1986.

There may be value in testing for residue of long-banned pesticides in drinking water. However, the Consumer Confidence Report creates the illusion that the pesticide contamination level in drinking water is well defined. ***There are no drinking water limits for many pesticides, nor are they tested for by most water departments.*** The water departments do not know completely what pesticides have been applied within their watershed.

Advantages of Real-Time Reporting

A number of advantages to real-time reporting can be suggested. They include:

- **Slug concentrations in water—**If a pesticide is applied to land or to vegetation, a rain event could cause the release of high concentrations (a slug) of that pesticide into the water. Under the current system there is no way to know of the possibility of those events or to plan for sampling and analysis of water potentially contaminated with those pesticides.
- **Public right-to-know—**While it is nice to know how many tons of herbicide or insecticide are sprayed in the U.S. annually, many people would rather know what their neighbor is spraying or planning to spray. Is there a justification for keeping that information out of the public domain?
- **Validation—**Applying pesticides in amounts greater than the label allows is a violation of the law. If the applicator is required to report prior to the application, the reporting system could be designed to flag miscalculations and prevent the applicator from misapplying.
- **Complaint Investigations—**For those instances where there is some kind of environmental damage caused by pesticide applications, the regulator will have information in hand to start the investigation. The regulator would still have to verify, and look for unreported or misreported applications, but compared to the present system the regulator would have more accurate and valid information.
- **Chemical analysis for pesticides in water—**It is difficult to impossible (and expensive) to test for pesticides in the water without knowing which specific pesticides could be there. Knowing what was applied and when and where they were applied is a fundamental starting point. Not having that information results in inadequate analysis.
- **Changes in Pesticide Use—**New pesticides are approved every year. New pesticides can sometimes become widely used within one growing season, depending on crop conditions. Pesticides, particularly insecticides, might be widely used some years and not

used at all in others. If someone was checking for environmental exposure of a particular pesticide, a long lag time in the core information is unacceptable.

- **Pesticide Concentrations in Air—**It will always be a difficult proposition to determine the level of pesticide concentrations in air. However, with real time, geographically correlated application information some methods could be developed and it is possible that air dispersion modeling could be used. The fact that we do not have this information now does not mean that it should not be an issue.

Concerns

The pesticide use reporting requirement should be kept as simple and easy to use as possible. Data analysis or retrieval should also be kept as simple as possible. Although pesticide use information can be by itself quite complicated, every effort should be made to keep data simple but usable.

All pesticide use can have potentially harmful effects on the environment, even the spray cans designed for home use. Pesticides that are not Restricted Use Pesticides can be harmful as well. This requirement should cover all pesticide applications to the extent that it is feasible, but there will be exemptions. Determining what those are will be left up to the writers of the law.

Certain activities, like water disinfection and applying paint that contains a fungicide, are pesticide applications, even though they would not be thought of as such by the general public. Once again, which applications are exempt from the requirement will be left up to others.

It cannot be stressed enough that this is an effort to improve calibration, not an effort to increase regulatory complexity. Information submittal and retrieval systems need to be kept as simple as possible.

Conclusion

Current methods of tracking pesticide use in the United States are inadequate because they leave significant gaps in the information available to the public and to environmental and health professionals. A real-time pesticide use reporting database is needed, as well as real-time access to the reported data.

The information about pesticide use in the United States is not properly calibrated.

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