

# Pesticide Safety Education Centers: A Feasibility Study

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*[Editor's Note: Since this Pesticide Safety Education Center feasibility study was completed, a Southern Region Pesticide Safety Education Center was established at the North Carolina State University in Raleigh. Dr. Brennan, is now the Associate Dean and Associate Director for Cooperative Extension, College of Tropical Agriculture and Human Resources (CTAHR) at the University of Hawaii.]*

## Abstract

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Pesticide education and safety training are critical to reducing personal and environmental exposure to pesticides. It is essential that pesticide safety instructors and state regulatory personnel be able to demonstrate an understanding of pesticide use, classification, regulation, toxicology, and environmental fate. Their credibility with applicators and the general public also requires that they develop effective communication and instructional skills. The feasibility of establishing Pesticide Safety Education Centers to train extension pesticide safety instructors and state and federal regulatory personnel was examined. Possible instructors and trainee groups were identified, mission and goals of a PSEC were defined, existing training models were examined, staff requirements were considered, sources of funding were explored, and a training evaluation system was suggested.

**Keywords:** pesticide, safety, education, center, feasibility, study, training, model, demonstration, professional, development

## Introduction

Paracelsus, the father of modern toxicology, pointed out nearly 500 years ago that there are no safe substances, only safe ways of using substances. This concept has been refined but still remains the fundamental principle of toxicology. Eliminating or reducing exposure can reduce risk. The applicator (often the owner operator) is ultimately responsible for the decision to use or not use a pesticide.

The applicator is also responsible for how the pesticide is used—therefore programs that help the applicator make more informed decisions regarding pest and pesticide management are essential to reduced risk pesticide programs. The Pesticide Safety Education Program is the logical vehicle for educating and training applicators. It is important to make sure that individuals who are responsible for conducting training are knowledgeable,

competent, and credible. Excellent training materials cannot overcome a poor presentation by a poorly prepared or misinformed trainer.

Because quality training is resource intensive, the idea has evolved to establish a regional Pesticide Safety Education Center that would serve multiple states. This article discusses the feasibility of creating and operating such a center.

### **Background: Pesticide Safety Education**

In 1960, the Administrator of the U.S. Department of Agriculture's (USDA's) Federal Extension Service (FES, now the Cooperative State Research, Education, and Extension Service) asked state extension service directors to designate a staff member to receive, analyze, and interpret pesticide information. The staff member was to disseminate such information to extension staff as well as coordinate extension recommendations related to pesticide use. The FES Administrator envisaged a need to hold schools, conferences, and intensive training programs with commercial pesticide applicators, veterinary practitioners, pesticide dealers,

professional consultants, garden store operators, nurserymen, and other related groups.

### *Pesticide Applicator Certification*

In 1972, Congress amended the Federal Insecticide Fungicide Rodenticide Act (FIFRA) to create a classification system for pesticide products. Those classified as Restricted Use Pesticides (RUPs) could only be applied by or under the direct supervision of a certified applicator. RUPs were those products that "may cause unreasonable adverse effects on the environment" or whose "acute dermal or inhalation toxicity ... present a hazard to the applicator or other persons." The amended FIFRA (Section 11) also authorized the Environmental Protection Agency (EPA) to require certification of applicators in a category consistent with the use of the pesticide. Standards for certification (40 CFR 171) for private and commercial applicators were published in 1974. EPA delegated pesticide applicator certification authority to the states upon approval of a State Plan. With a few notable exceptions, states developed their own plans taking into account their own pesticide regulatory authority and

pesticide management needs. As a result, certification requirements vary from state to state but all meet the minimum Federal requirements as interpreted by the Administrator of EPA.

### Pesticide Applicator Training

The Congress also directed that the EPA Administrator, in cooperation with the Secretary of Agriculture, "...use the services of the cooperative state extension services to inform and educate pesticide users about accepted uses and other regulations made under this Act" (FIFRA Section 23c). The Pesticide Applicator Training program began in 1975. Today it is known as the Pesticide Safety Education Program (PSEP). The goal of the program was to train users of RUPs in the effective and safe use and handling of pesticides, including storage and disposal. Because training is linked to certification, the program also serves as an important means of reaching applicators with information about integrated pest management, surface and ground water protection, worker protection, and endangered species protection.

### Training and Certification Personnel

Every year, newly hired as well as experienced extension agents, educators, and specialists, along with federal, state, and tribal pesticide program personnel, educate, train, and in other ways communicate with pesticide applicators, homeowners, policy makers, and legislators. They are often asked to address changes in regulations, pesticide chemistry, application techniques, and pest management practices. They must understand how pesticides affect the environment and how the environment affects pesticides. They must also be able to communicate what is known and what is unknown about pesticides and human health. This often requires some level of training in toxicology including acute and chronic effects, mutagenicity, teratogenicity, oncogenicity, environmental endocrines, and multiple chemical sensitivities. They must not only understand the potential impact of pesticides on environment and human health, but they must be able to explain those impacts in a way that is understandable to their audiences. They must be sound and credible.

All individuals responsible for pesticide safety and risk mitigation need to improve and maintain their professional skills and understanding of the complex issues involving pesticide use and regulation. This is particularly true for those in state cooperative extension services. Although most extension professionals have college degrees in entomology, plant pathology, weed science, or related disciplines, most would benefit from additional training in adult education and risk communication. Moreover, when these professionals first join state cooperative extension services, they often lack a working knowledge of the subject matter required for training pesticide applicators (e.g., pesticide toxicology, chemistry, formulations, application techniques and equipment, storage or disposal practices, pesticide regulations, or the principles of integrated pest management). This knowledge is at the core of the pesticide safety training program. Because pesticides are so extensively regulated, the same knowledge and skills expected of trainers and applicators are also expected of regulatory personnel responsible for developing certification programs and policies or enforcing pesticide laws and regulations.

### *National Review of Applicator Training and Certification*

In 1996, EPA Certification and Worker Protection Branch and USDA Cooperative State Research Education and Extension Service, together with representatives from state PSEP programs, state lead agencies (SLAs), and the Department of Defense Armed Forces Pest Management Board initiated a national review of state pesticide applicator training and certification programs. This group, known as the Certification and Training Assessment Group (CTAG), conducted a national survey of state training and certification programs in 1997. These surveys and the discussion they generated were the basis for a draft final report, *Pesticide Safety for the 21<sup>st</sup> Century*, issued by the CTAG in January 1999. The report included five goals with 37 proposed changes. The second goal focused on providing high quality pesticide education and safety training programs. The CTAG recognized the need to ensure that those responsible for pesticide safety education and training possessed the knowledge, skills, and abilities to deliver effective training. Such training must keep pace with the evolving technological advancements and our

changing understanding of pesticide risks.

### **Feasibility Study**

State pesticide applicator training and certification programs have evolved individually since their inception 27 years ago. Factors affecting this evolution include resources, state laws and regulations, policy decisions, and the personal commitment and ingenuity of program personnel. In 1997-98 the National Program Leader for the PSEP program appointed at least two PSEP coordinators from each region to a committee to work on developing a national reporting form to address the requirements of the Government Performance Results Act (GPRA). The diversity of content and quality of state training standards became apparent during committee discussions.

Both the PSEP GPRA committee and the CTAG recognized the need for more qualified pesticide safety trainers. In addition, efforts to develop a workable strategy for implementing the 1996 Food Quality Protection Act focused attention on the importance of pesticide education and training as the first step in any risk mitigation program. If

exposure can be reduced, risk can be reduced. Pesticide residues on food and in air and water can be reduced by more efficient pesticide use. Occupational exposures to applicators and handlers can be reduced by more effective pesticide management practices (application, transportation, storage, and disposal). It was clear that a strategy for improving applicator training was needed and that the focus should be on the trainer rather than the content of training.

Improving the skills and competencies of trainers and program managers is resource intensive. Unfortunately, most state training and certification programs are resource poor. Rather than ask each state to develop its own professional improvement program, it was more logical to encourage states to share resources to build a comprehensive "in-service" training program. The feasibility of creating a regional Pesticide Safety Education Center (PSEC) to meet this need was the basis for this study.

The proposal to conduct the feasibility study was developed by the American Association of Pesticide Safety Educators (AAPSE) and supported with public and private funds. The

committee responsible for the study included extension PSEP coordinators, SLA certification managers, the Certification and Worker Protection Branch of EPA, private industry, and others. Those who could not attend the two meetings were invited to send a representative or provide written comments to the draft documents.

### **Questions and Discussion**

The questions included in the proposal were meant to frame some of the issues and generate additional ones. During the first meeting of the committee, most questions included in the proposal were modified. The questions and discussions were further clarified at the second meeting. The final questions and a summary of the discussions and recommendations follow.

### **Who should attend training at a Pesticide Safety Education Center and why?**

#### *New PSEP instructors and SLA staff*

New extension instructors and SLA staff often lack academic training and experience in pest management and adult education. Centers would give them an opportunity to obtain a comprehensive background in pesticide regulation,

management, pesticide application, principles of pest management, toxicology, and environmental fate. The centers would also give them an opportunity to learn and practice techniques for training adult applicators. Such training would help them develop pesticide training and regulatory programs and understand pest management issues. It would also increase their credibility with stakeholders.

#### *Tribal nations*

Approximately 30 tribal nations have received approval to conduct their own pesticide regulatory programs. While many of these programs currently focus on enforcement issues, they may be expected to include a comprehensive certification and training component as they address pest and pesticide management issues peculiar to tribal lands. Individuals responsible for certification and training could be trained in the same way new PSEP instructors or SLA staff are trained.

#### *Current PSEP instructors, county agents, inspectors and certification managers*

PSECs could be used to provide refresher training or training in new topics, e.g.,

endocrine disruptors, immunosuppressants, resistance management, and genetically modified organisms (GMOs). PSECs could also be used to develop training programs for specialty chemicals (e.g., TBT, metam sodium, chlorine) or specialty uses (e.g., fumigation, aquatic pest management, quarantine).

#### National Resource Conservation Service

NRCS and SWCD (Soil and Water Conservation District) personnel develop and approve conservation plans that include pest and pesticide management elements. These personnel could be trained individually at the state level by PSEP coordinators, although pest and pesticide management training is only one component of needed training and could be incorporated into existing NRCS in-service training. Individuals responsible for in-service training could benefit from attending a train-the-trainer course that focuses on NRCS pesticide responsibilities.

#### Other audiences

Many industries or organizations might want to enroll trainers or supervisors in a PSEC-sponsored course. Examples suggested by the committee included: extension

IPM coordinators, health care providers, utility companies, AmeriCorps volunteer Worker Protection Standard trainers, school and building maintenance worker associations, environmental organizations, chemical manufacturers, and various state and federal departments of transportation, labor, and natural resources. In addition, specific organizations whose members are responsible for education or training such as vocational agriculture and community college instructors, school science teachers, and certified crop advisors would also benefit from a trainer-training program.

#### **What is the core mission of the centers?**

The mission of the centers is to strengthen the infrastructure of the pesticide safety training and certification programs by:

- Insuring that pesticide safety trainers are knowledgeable and competent in pesticide use and pest management practices, pesticide regulation, and adult education.
- Insuring that extension and regulatory personnel have a better understanding of how and why pesticides are used. This understanding is

critical to developing competency-based certification examinations, recertification programs, and reasonable enforcement policies.

- Increasing the credibility of training and certification programs among the user community.

### **Are there existing models to build on?**

None of the existing training center models seemed appropriate to the proposed mission of PSECs. Structural pest control training centers deal with the applicator, not the instructor, and most are statewide, rather than regional. EPA's Pesticide Regulatory Education Program courses for pesticide safety trainers and certification staffs focus primarily on education rather than training. Military pest management training involves correspondence and resident phases, but again, training focuses on applicators. Each of these models has some positive aspects that could be adopted, such as use of advisory committees, multiple sources of funding, classroom and field training, classroom interaction, diversity of instructors, and use of a full-time coordinator.

### **What are the staffing needs of a PSEC?**

Each PSEC would need a full-time coordinator and an advisory committee. The coordinator would handle correspondence, course announcements, registration, housing, travel, fiscal matters, and general program coordination. The advisory committee would be responsible for identifying training needs, potential instructors, and possible funding sources; determining course content and standards; providing certification; establishing internal policies and budgets; and setting specific goals. If more than one PSEC were created, each would have a separate advisory committee. The committees would coordinate efforts, avoid duplication, and share information about resources and needs. The advisory committee should include members representing state extension services, chemical and equipment manufacturers, regulatory agencies, and other stakeholders.

### **Who would provide financial and physical support?**

Support must involve public and private sectors. Public support at the federal level



should come from USDA and EPA, given their responsibilities as defined in FIFRA for supporting certification and training/education programs and related programs. Private sector funding should be provided by those who stand to benefit from having better trained applicators. This would include the chemical manufacturers, structural pest control associations, lawn care and turf management associations, aerial applicators, commodity associations, and related groups. Funding could also be solicited from private foundations with an interest in environmental protection, production agriculture, or public health issues.

Both land grant universities and SLAs can provide in-kind support such as instructors. Land grant universities can also provide training facilities (classrooms, labs, field sites), and administrative services. SLAs can provide financial support from product licensing fees (particularly those from RUPs) or other sources.

### **Who would provide instruction and training?**

The PSEC coordinator would be charged with recruiting instructors/trainers from the land grant universities, regulatory agencies, and

private industry. Equipment manufacturers could provide instructors to demonstrate how to select, use, and maintain specific types of equipment. Chemical manufacturers could provide specific training related to formulations and specialty products, including adjuvants. Efforts should be made to avoid using the same instructional resources for every training program.

### **What is the role of the host institution for a PSEC?**

Pesticide Safety Education Centers could be similar to existing centers commonly found at land grant universities. Land grant universities routinely administer grants and verify compliance with state and federal guidelines. Overhead charges could be negotiated so as not to exceed current federal rates for training projects.

### **How would training be evaluated and who would do it?**

Standard university course evaluations (e.g., content, delivery, organization) could be used to evaluate students and instructors. Pre- and post-training exams would be used to measure student comprehension.

The PSEC advisory committee should consider what outcomes (such as GPRA measurements) they expect from the program and how those outcomes can be measured. Suggested outcomes include:

- reduced number of accidental exposures
- reduced number of adverse environmental impacts
- greater public awareness of pesticide and pest management risks and benefits
- more effective use of products, particularly reduced-risk/knowledge-intensive products
- continued availability of products that might otherwise be cancelled

AAPSE or the advisory committee could appoint an evaluation committee to conduct the student evaluations, develop the pre- and post-training exams, and certify PSEC graduates. Procedures would have to be developed to measure GPRA and other goals and objectives. The committee could also interview instructors and recommend changes as needed. The evaluation committee report would be submitted to the advisory

committee after each training course.

### **How many PSECs are needed?**

At least one pilot PSEC should be created. A second pilot PSEC would help address geographical considerations, differences in program structure, differences in crop production systems, and the diversity of potential audiences. The actual number of Centers would also depend on regional differences in how pesticide safety education and training are delivered. For example, many states use a portion of a county agent's time to deliver applicator training programs. Development of training materials and program coordination is left to state staff. Other states have one or two extension specialists or staff responsible for conducting training and developing training materials.

### **Where would PSECs be located?**

PSECs need to be accessible, have institutional support, meet local clientele needs (agriculture and non-agricultural), and have access to physical resources (classrooms, labs, field plots) and housing. Access to chemical industry and

equipment manufacturers would be a definite plus. Geographically, PSECs could be located in the East, Midwest, and/or the West. Location may be defined by cropping systems, regional needs, or administrative interests and financial support. Ultimately, the number of centers will depend on the success of one or two pilot projects.

### **What is the estimated annual operating budget?**

The cost of operating a full-time PSEC could only be roughly estimated. There are fixed costs (estimated at \$100,000 per year for a coordinator, part-time assistant, and indirect costs) and operational costs related to each class conducted. Operational costs would vary depending on the number of participants (trainers and trainees), length of the class, course materials, travel, housing, meals, field trips, and other factors. No attempt was made to develop a budget because of the large number of variables.

### **Conclusion**

The advisory committee concluded that extension and regulatory personnel, particularly newly-hired personnel, would benefit from completing a comprehensive

course on pesticide safety and management and that the PSECs, as envisioned, could provide the requisite training. Committee members also concluded that the diversity of potential trainees in other public agencies and in the private sector was greater than anticipated in the study proposal.

The committee recommended that a proposal be developed to fund at least one pilot Pesticide Safety Education Center taking into account the questions addressed by the feasibility study. In addition to any funding agency requirements, the proposal must clearly define the following:

- target audience (identification, solicitation, selection, number)
- funding and in-kind services
- selection of instructors
- training materials for both trainers and trainees
- timeframes
- needed facilities (classrooms, labs, field facilities, housing, etc.)
- administration (organization, staffing)
- evaluation

## Acknowledgements

The author thanks and acknowledges the PSEC Feasibility Study Committee and their efforts in completing the study. Their suggestions and insight helped identify important issues overlooked in the original proposal. Some of the comments included in this report resulted from individual discussions with others who expressed an interest in the proposal. Members of the committee included: Robert G. Bellinger (Clemson University), Robert McKenna (Armed Forces Pest Management Board), Natalia Clifton (University of Massachusetts), Tom Delaney (Professional Lawn Care Association of America), Mary L. Grodner (Louisiana State University), Julie A. Haigler (North Carolina Department of Agriculture and Consumer Services), Jeanne Heying (Certification and Worker Protection Branch, OPP-EPA), Patricia Hipkins (Virginia Tech), Win K. Hock (Pennsylvania State University), John W. Impson (USDA/CSREES), Kevin Keaney (Certification and Worker Protection Branch, OPP-EPA), Paul E. Kindinger (Agricultural Retailers Association), O. Norman Nesheim (University of Florida), Patrick O'Conner-Marer (University of California, Davis), Charles G. Rock (Novartis),

Sherman Takatori (Idaho Department of Agriculture), Edward F. Vitzthum (University of Nebraska) and Melanie Zavala (University of California, Davis).

Funding to conduct the feasibility study was provided by the Agricultural Health and Safety Center at the University of California at Davis (funded by the National Institute for Occupational Safety and Health under Cooperative Agreement U 07/CCU 9066162), the Responsible Industry for a Sound Environment (RISE), and the American Crop Protection Association (ACPA).