

Personal Protective Equipment Displays for County Extension Service Programs

Monte P. Johnson, Extension Specialist, Department of Entomology, University of Kentucky, Lexington, KY, mjohnson@ca.uky.edu

Elizabeth P. Easter, Professor, Department of Textiles, University of Kentucky, Lexington, KY, hetliz@pop.uky.edu

Abstract

Monte P. Johnson, Extension Specialist, Department of Entomology, University of Kentucky, Lexington, KY, mjohnson@ca.uky.edu

Elizabeth P. Easter, Professor, Department of Textiles, University of Kentucky, Lexington, KY, hetliz@pop.uky.edu

Personal protective equipment (PPE) displays are valuable assets to Cooperative Extension Service programs such as farm safety and pesticide applicator training. Consequently, the goals of this project were to provide county Cooperative Extension Service (CES) offices with PPE display materials and to survey county CES agents concerning pesticide safety programs. Survey results showed that most county Extension agents provide pesticide safety training primarily through private pesticide applicator training. Agents indicated that more training materials were needed. The PPE displays will be used for private pesticide applicator training, office displays and field days. Pesticide safety issues were found to be increasing in significance.

KEYWORDS: applicator, extension, education, pesticide, safety, training

Introduction

Within the agricultural industry, pesticide handlers have the greatest potential for exposure to hazardous chemicals. They participate in mixing, loading, applying, cleaning, and maintaining the equipment. Their potential dermal exposure (PDE), the amount of pesticide found daily on the outermost garment, can sometimes be measured in grams/person. Research has shown that protective outer clothing may serve as an important barrier that effectively reduces the PDE by as much as 90% and thus lowers the absorbed daily dose. However, most farmers and agricultural workers do not always employ adequate skin protection when using pesticides (Abrams et al. 1991). A survey of California growers and commercial pesticide applicators suggested that the growers were the higher-risk group; not only did they use more hazardous chemicals, but they were less likely to agree with the need for certain precautions. In general, users of more toxic chemicals indicated they recognized that

fact but appeared to downplay the potential danger (Rucker et al. 1986).

The effect a pesticide may have on humans depends on various factors such as physical and chemical properties (toxicity, degradation, volatility, etc.) of the pesticide, the dose or concentration of the pesticide, the duration of the person's exposure, susceptibility of exposed persons; and the type of exposure (inhalation, ingestion, dermal). Symptoms of minimal over-exposures can mimic many other illnesses and, therefore, may often be under-reported. Multiple episodes of long-term, low-level exposure to pesticides are reportedly associated with many health risks to farmers (Murphy 1992). Cordes et al. (1988) listed cancers, birth defects, sterility and infertility problems, genetic damage, and neurological and behavioral abnormalities that reportedly result from overexposure to pesticides. The day-to-day evaluation of potential pesticide hazards through the various U. S. Environmental Protection Agency (EPA)

registration review processes clearly indicate the need for developing information on Personal Protective Equipment (PPE). PPE includes all types of clothing and equipment designed to reduce and prevent personal exposure to hazardous materials. Not only are PPE requirements important for dealing with acutely toxic pesticides but, they are also important when dealing with some products identified as potentially causing chronic health problems (Nielsen and Moraski 1986).

Studies have shown that exposures to pesticides can be greatly reduced by the use of appropriate PPE. Batel and Hinz (1987) showed large reductions in dermal exposure to the hands and head area by using gloves and hoods. Pependorf (1987) concluded that dermal doses were reduced by coveralls and the use of hand protection (gloves) can decrease dermal exposure by a factor of ten. Experiments using fluorescent tracers mixed with pesticides provide strong visual examples of how well PPE prevents exposure (Fenske 1987).

In the report entitled "Agriculture at Risk; A Report to the Nation: Agricultural, Occupational and Environmental Health: Policy Strategies for the Future" (1989), it was noted that acute toxic reactions and, more recently, chronic neurological health effects have been linked to the widespread use of modern pesticides. Exposure to pesticides constitutes an important health issue worldwide. While routes of occupational exposure are usually dermal or respiratory, effects of exposure are most often systemic. This report stresses the need for more education at all levels. Dealing effectively with the health and safety problems of farmers and agricultural workers requires a well-founded knowledge of the problems, their causes, and preventive mechanisms. However, educational programs for delivering this knowledge are low in number and often of questionable effect. More and better programs are needed for all involved - from the agricultural workers and their families to the professionals who deliver health and safety services. An increased level of awareness and acknowledgment of the hazards faced by the agricultural work force is needed.

Educational programs for farm operators, farm workers, and their spouses are equally important, given the severity and omnipresence of agricultural dangers. [Farmers' wives in particular, who are constantly aware that they, their husbands, and their children are being exposed to hazardous materials, are typically eager to learn how to protect their families.] Every opportunity to encourage safer work practices must be taken. Some efforts have been made to expand health and safety education. United States Department of Agriculture (USDA) Cooperative Extension Service (CES) efforts have suffered from a decrease in funding (in constant dollars) over time and consequently a decrease in the number of farm safety specialists. Due to budgetary constraints, many institutions have had to reduce funding for a variety of items. The CES Offices are currently under pressure to reduce expenses. Consequently, most CES county offices cannot afford to purchase materials such as PPE displays. Also, programs presently offered by such organizations need to be evaluated to determine their likelihood of altering unsafe work practices (Agriculture at Risk 1989). Abrams et al. (1991) reinforce this need by stating that we need to improve education of farm workers and their families to the potential hazards of exposure to the chemicals that they are in contact with on a daily basis.

Purpose and Goal of Project

The purpose of the project was to enhance the county Extension farm safety programs. The first objective of the project was to expand the educational resources provided to county Extension Service offices by providing PPE display materials. Our hypothesis was that "PPE display materials were a valuable asset at farm safety programs and private pesticide applicator training sessions, resulting in positive changes in behavior and attitudes towards wearing PPE". PPE displays allow trainees to handle the equipment, and instructors can show how to properly use it. The second objective of the project was to survey the recipients of the display materials, i.e. the county offices, to determine the impact

of the display materials on the farm safety programs.

Materials and Methods

The Worker Protection Standard (WPS) recommends PPE as a safety measure when using certain types of pesticides. Training of commercial pesticide applicators, conducted primarily at the state level by Extension State Specialists, utilizes PPE displays to illustrate product attributes and allow trainees to have hands-on experience with the equipment. Evaluations of these training programs have provided written comments and positive feedback to the significance of the displays of PPE. However, for non-commercial applicators, most training is conducted at the county extension offices. Extension state specialists receive numerous requests from the county level for materials to supplement training. At the county level, pesticide training programs illustrating the type of PPE products available has primarily depended on visual aids such as slides, videotapes, and/or mail order catalogs. To enable the researchers to meet the first objective of this research project, PPE visual display materials were reviewed from various sources including mail-order catalogs and retail stores. The criteria used in evaluating the materials included a need for products that would meet a wide variety of applications, provide various levels of protection, and be transportable. After a thorough review of all available sources, the decision was made to purchase a pre-package PPE kit enhanced with WPS materials from Gempler's, a mail order business located in Belleville, Wisconsin, which included the following:

- 1 cardboard manikin (see Figure 1)
- 1 white TYVEK chemical-resistant coverall
- 1 pair of green nitrile, chemical-resistant gloves
- 1 chemical splash-proof goggles
- 1 NIOSH-approved dual-cartridge respirator w/pesticide cartridges and pre-filters
- 1 pair of yellow latex chemical-resistant booties
- 1 chemical-resistant yellow over-cap
- 1 PVC green chemical-resistant apron
- 1 EPA-approved WPS field warning sign
- 1 Safety/usage information card on PPE
- 1 Emergency medical sign (for WPS use)
- 1 Re-usable application list poster (for WPS use)

Next, funding was needed to purchase 120 kits for the county extension offices in the state. Therefore, a grant was submitted to the Southeast Center for Agricultural Health and Injury Prevention and the University of Kentucky Cooperative Extension Service. Funding was secured and PPE kits were purchased from Gempler's. Funding was also provided to develop a publication to supplement the PPE display materials.

To meet the second objective of the project, a questionnaire was developed by the researchers and mailed to the 120 county extension offices. The primary purpose of the questionnaire was to determine the extent and nature of pesticide safety programming for which the PPE displays were to be used. The responses to the questionnaire were analyzed and are summarized in this report.

Results and Discussion

One hundred and twenty county extension offices received a PPE display kit to supplement the educational programs on pesticide and farm safety. A companion publication entitled "Personal Protective Equipment for Pesticide Applicators" (PAT-6) was developed and provided in mass quantities to each county agent.

Ninety-two (92) county extension agents responded to the survey, which resulted in a 77% return rate. The results showed that overall the PPE visual displays were viewed as an asset to the county Extension farm safety programs.

A summary of specific questions is presented in Table 1.

Table 1. Questions and response frequencies from the county Cooperative Extension Service agent survey concerning pesticide safety.

QUESTIONS	RESPONSES					
	Do you currently provide a pesticide safety program in your county?	Yes.				
	No.					5
If you have a program in pesticide safety, with what program is it associated?	Pesticide Applicator Training.					84
	4-H/Youth Development.					7
	Vocational Agricultural Classes.					6
In what ways can the pesticide safety program in your county be improved?	More training materials.					64
	Assist in developing and holding programs.					16
	No improvement needed.					9
Are there other pesticide safety programs active in your county that are NOT directed by your office? If yes, what groups direct these programs?	Yes.					16
	Private Pesticide Dealers.					4
	Farm Bureau.					3
	Agribusiness.					2
	No.					66
	Don't Know.					9
What do you currently use to conduct pesticide applicator training sessions and how effective are the different media?		High	Good	Fair	Poor	
	Slides	4	7	15	0	
	Videotapes	18	50	11	0	
	Displays	11	30	7	0	
	Quizzes	2	11	5	2	
	Lecture	1	4	1	0	
How many functions are you involved in during a calendar year that relate to pesticide safety?	Pesticide Applicator Training.					561
	Field Days.					84
	Community Events.					43
	Demonstrations.					83
	Commodity Group Activities.					93
How will you use your Personal Protective Equipment display?	Pesticide Applicator Training.					72
	Office Display.					23
	Field Days.					20
	Demonstrations.					9
Do you foresee pesticide safety issues becoming more or less important in the future?	More.					69
	Same.					17
	Less.					0
	Don't Know.					2

Conclusions

The PPE kits have enhanced the county Extension farm safety programs. Based on the results of the survey the following conclusions can be drawn:

- Most county Extension agents provide pesticide safety training.
- Pesticide safety training is primarily delivered through private pesticide applicator training.
- Responding county agents conduct over 560 private pesticide applicator training sessions each year.
- County Extension agents want more training materials dealing with pesticide safety.
- Videotapes and displays appear to be most useful to private pesticide applicator training.
- PPE kits will be used primarily for private pesticide applicator training, office displays and field days.
- Most county Extension agents foresee pesticide safety issues becoming more important.

The results of this project have given guidance to long-range objectives for pesticide applicator training programs. Based on the results of this project it is recommended that other states consider the purchase of PPE kits to supplement their farm safety and pesticide applicator training programs.

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Figure 1. Personal Protective Equipment (PPE) Display Kit.

