

# Mountain Pesticide Education and Safety Outreach Program: A Model for Community Collaboration to Enhance On-Farm Safety and Health

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This article showcases the outcomes of the Mountain Pesticide Education and Safety Outreach program, a collaborative effort between Christmas tree growers, cooperative extension, farmworkers, farmworker health outreach staff, and others to reduce pesticide exposure and on-farm injuries. Lessons learned during the project that can be adopted by other communities will also be shared.

**M**any Latino workers find employment in the Christmas tree industry in rural western North Carolina. A majority of the estimated 5,000 workers hired each year to work on Christmas tree farms are Latino. The language barrier between employers and workers in this industry makes this workforce vulnerable to pesticide exposure and other occupational safety risks. The goal of the Mountain Pesticide Education and Safety Outreach program, or Mountain PESO program, was to develop industry-specific educational materials for Christmas tree farms and to deliver on-site training programs for Latino workers that could be modeled and replicated in other Christmas tree production areas. Since 2004, it has evolved from a tailgate training activity into large-scale farmworker field days and in-depth integrated pest management (IPM) training for Latino workers.

Frustration with communication and language barriers are a problem among growers and workers in the Christmas tree industry and can have health and environmental implications [1]. A vast majority of growers, even those with the best intentions, are not equipped with the language skills to effectively communicate many important safety messages to their workforce. Worker and grower unfamiliarity with some pesticide safety regulations can also influence the extent to which industry participants receive proper pesticide safety training. Some safety/informational materials provided to workers are not applicable to the crop with which they are working. These problems can translate into environmental risks when Latino workers apply pesticides without being properly trained. Grower and worker awareness, of pesticide and occupational safety, has immediate and long-term effects on the welfare of the workforce, as well as on the image of agriculture.

## Initial Program

The Mountain PESO project was initially developed, in 2004, because Christmas tree farm managers had expressed interest to Watauga County's agriculture extension agent. They wanted to provide their workers with more-appropriate pesticide safety training and to help certain members of their Spanish-speaking staffs to develop and coordinate regular pest scouting schedules on their farms. The first activity of the PESO program included a tailgate training program developed in Spanish by the extension agent (fluent in Spanish), with input from 2 leader Christmas tree growers and a former Christmas tree worker (Latino). Input from growers indicated that training emphasis should be placed on communicating the importance of proper safety equipment use for specific chemicals and on application procedures commonly used in the production of Christmas trees.

Insecticides for Christmas trees are applied with either high-pressure hose sprayers or tractor-driven air-blast mist blowers [2]. Growers mentioned that few workers participate in this type of application and that workers who do more-specialized spraying get more training on site. More workers perform herbicide treatments with Roundup, a non-restricted herbicide, by backpack sprayers during the summer months, to eliminate weed competition. Emphasis was therefore placed on training farmworkers on proper safety equipment use and on application practices with high-pressure and backpack pesticide applications, with the most common Christmas tree chemicals.

Training events were coordinated with each grower, to maintain rapport and to avoid work schedule conflicts. Each training event took place in the early morning, before field-work began, and lasted for approximately 1 hour. The first trainings were delivered at 5 Christmas tree farms, to 55 workers, in Watauga County. Each training event covered the following items and was followed with a Q&A session,

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where workers voiced their questions and concerns about pesticide application: (1) exposure routes of pesticides and health effects of improper safety/application practices; (2) chemicals used in Christmas trees and Personal Protective Equipment required for each type of application; (3) handling, mixing, and reentry intervals; (4) hand washing in the field and proper clothing protocol for postapplication.

At the end of each training event, each worker was provided their own pair of gloves, safety goggles, respirators, rubber boots, and 2 Tyvek suits, to encourage their proper use in the field. Providing free equipment to workers was seen as a positive incentive for grower participation in the program. While employers are required to provide this type of equipment anyway, free equipment offset any perceived loss of productivity by having their workers in training for part of a workday. Handouts in Spanish that outlined proper hand washing and handling of contaminated clothing were also distributed as supplemental materials.

Feedback from the initial round of PESO training was overwhelmingly positive. Growers who participated in the project indicated that they noticed their workers wearing safety equipment more frequently during pesticide applications. Use of safety goggles and respirators was noticeably improved from past years. Seven workers interviewed a month after the safety program indicated that they felt more knowledgeable about proper application practices after the training sessions and were more conscientious about proper use of safety equipment. Workers and growers appreciated the informal atmosphere of the training, which allowed for interaction and questions.

### **Follow-up Programs**

After the first PESO training, and because of increasing grower interest in improving the pest scouting abilities of their Latino employees, Hamilton, Sidebottom, and county extension agents developed a pilot IPM training program in Spanish that was delivered in 3 western North Carolina counties in spring 2005. Latino employees typically visit each tree multiple times during the growing season. If taught how to recognize pests, the signs of infestation, and thresholds, they can provide growers with the most-current information on pest levels. The ability to control pests in a timely manner encourages growers to adopt nontraditional methods of pest control and to reduce pesticide use. This project was funded by the North Carolina Department of Agriculture Pesticide Environmental Trust Fund.

Approximately 100 Latino farmworkers attended the trainings, which included a formal classroom component that allowed workers the opportunity to learn about important pests in the industry. This was followed by an outdoor scouting and hands-on pest identification component, to build worker confidence in scouting. The IPM program also had a pesticide safety component, conducted by Hamilton, the bilingual pesticide specialist with the North Carolina Department of Agriculture (NCDA), and a nurse with the

Farmworker Health Program. A preworkshop survey developed by Hamilton revealed that more than 90% of the workers were involved in the application of agricultural chemicals and spent an average of 15 days (per year) applying insecticides and an average of 40 days applying herbicides (primarily Roundup). Again, grower and worker feedback from these trainings was overwhelmingly positive.

In 2006, a farm safety field day was conducted in Ashe County with 160 Christmas tree workers and personnel from 5 other state and county agencies, including the North Carolina Department of Labor, the Ashe County Sheriff's Department, and NCDA. Participating workers were surveyed immediately after the workshop on what they felt were the most important topics covered during the event. Workers indicated that each of the topics covered (including chainsaw safety, shearing safety, baler safety, and heavy equipment safety) was important. Many participants also highlighted pesticide safety and reentry intervals as especially important. Follow-up interviews were performed with 25 workers who had participated in the field day. They suggested that more time should be devoted to more-industry-specific pesticide safety education—especially among new employees. While growers often distributed a safety brochure for the industry, many complained that it was neither up-to-date nor adequate for current chemicals and production practices.

### **Lessons Learned**

Cooperative Extension in the Christmas tree counties is uniquely positioned to reach growers, as well as the underserved farmworker demographic, by capitalizing on the rapport and respect established by county agents who work with these industry participants. An important element of the PESO program was multiagency collaboration. The study by Hamilton and colleagues [3] showed that grower distrust of individuals perceived as "activists" and visitation practices of certain labor advocacy and health groups have created a rapport barrier and have daunted the success of a number of farmworker education programs—despite their good intentions. To raise the comfort level and to improve collaboration between all participant groups, personnel from other farmworker outreach programs and agencies were invited to participate in training activities. Christmas tree growers, extension agents and specialists within the North Carolina Cooperative Extension Service, inspectors with the North Carolina Department of Labor, the North Carolina Farmworker Health Program, and NCDA inspectors worked together on these projects.

While bilingual publications are becoming more prolific for use by Latino workers, more programming and training delivery in Spanish may ameliorate pesticide exposure risks among this population. Expectations that a majority of the industry's Latino workers and growers will become bililingually proficient should be modest. More-formalized, more-standardized, and more-frequent pesticide safety training

should be implemented, to improve grower and worker understanding of safety issues. While growers and workers often develop their own strategies for managing difficulties with the language barrier, improved training in Spanish with an entity with which rapport has been established offers a greater chance for improving education and reducing risk.

Development of appropriate, industry-specific pesticide and farm safety training strategies, and delivery to this underserved labor force, is one way to reduce exposure risk. Additionally, if more Latino field personnel are trained in basic IPM scouting techniques and strategies and are active participants in on-farm IPM activities, pest identification and control can be more quickly and efficiently executed. A reasonable expected outcome would not only be a reduction in the quantity of chemicals applied, but also a reduction in exposure risks to on-farm personnel. During the last couple of years, North Carolina State University's Department of Environmental and Molecular Toxicology has developed Pesticides and Farmworker Health Toolkits, which are industry-specific bilingual resources to be used in formal and/or informal training sessions. The materials are highly visual and interactive and take into consideration many of the recommendations provided by employers and workers. Much of the information in the health tool kit for Christmas trees came from recommendations gleaned from surveys and

observations from the Mountain PESO project. Because of positive feedback from growers, farmworkers, and agency personnel alike, the project coleaders have been seeking funding for its expansion and have been modeling the training approach for other commodities. **NCM**

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