

Project Number: 9278578

Title: Pesticide Exposure of Rose Greenhouse Workers

Division: DSHEFS

Project Officer: Brian Curwin (2002-2006), Wayne Sanderson (1996-2002)

PO Degree: MS

PO Area of Expertise: Industrial Hygiene

Start Date: 10/1/1996

End Date: 3/1/2007

Total Budget over the Project Period: \$607,666

Goal: Chronic Effects of Agricultural Exposure

Sub Goal: Exposure Assessment Research

Challenge/Issues:

Under the U.S. Environmental Protection Agency's (EPA) Worker Protection Standard (WPS), workers are excluded from entering pesticide-treated areas for periods ranging from 4 to 72 hours after an application, depending on the toxicity category of the pesticides. On June 10, 1994 the EPA granted cut-rose producers an exception to entry restrictions of the WPS. The major condition of this exception allows workers early entry for a maximum of three hours in any 24-hour period into pesticide-treated areas to harvest roses. This exception was granted because cut-rose producers claimed they would suffer substantial economic loss if they were prohibited from harvesting roses before the restricted-entry interval (REI) had expired. On December 20, 1996 the rose growers received a two-year continuance of the exception that allowed workers early entry into greenhouses before the REI has expired. Currently, little data exists documenting pesticide exposures of workers while harvesting roses during the REI period, but such data are needed to evaluate the potential health risks of harvesters operating under this exemption. During this two year period the National Institute for Occupational Safety and Health (NIOSH) conducted a study to evaluate pesticide exposures of workers in rose-growing greenhouses as well as evaluate the effectiveness of work practices and protective clothing to reduce worker's exposures.

Rose growers contend there is currently no technology available which will allow them to go one or more days without a twice daily harvesting of roses. The time period from when rose buds are too tight to open to a stage when the buds have opened too far to be of value for commercial trade can occur over 2 to 6 hours depending on the rose variety, light intensity, temperature, and humidity. They claim that with the loss of registered pesticides, introduction of new pest problems, and continued market demand for the perfect rose, they cannot survive economically without an exception to the WPS which allows entry for harvesting. Depending on the product applied, the associated REI, and the time of year, growers could lose as much as 25-50% of their daily revenues on the days when pesticides are applied. However, little data is available to evaluate the potential health risks harvesters may encounter due to early entry into pesticide-treated houses.

The objectives of this project are: (1) to document the types and amounts of pesticides used in the rose-production industry; (2) to measure pesticide exposures and absorbed doses of workers tending and harvesting roses; and, (3) to evaluate the work practices, use of protective equipment, and worker safety and health training used in the rose-growing industry.

Activities:

Several different types of pesticides are used on roses, including organophosphate and carbamate insecticides and a variety of fungicides. These pesticides may be applied as a dust, mist, spray, or drench which may result in aerosol and vapor exposures to the applicators and possibly residual aerosol and vapor exposures to harvesters. Rose plants can grow to several feet and may be spaced so closely that workers have potential skin exposure to pesticides on all parts of the body. Workers harvesting roses often wear coveralls and gloves, but the appropriate use and efficacy of this equipment needs to be evaluated.

In 1999 a field investigation was carried out to measure pesticide exposure to rose greenhouse workers. Air, patch and glove dosimetry, and urine samples were collected from rose harvesters shortly after the roses were sprayed with a pesticide. The samples were analyzed for acephate, chlorpyrifos, diazinon, piperalin. In 2000, methods were developed to analyze the various sampling media for the four pesticides and laboratory analysis was completed in 2001. Preliminary data analysis began in 2001. However, due to the departure of the original project officer, the data analysis has not yet been completed. Key personnel involved in this study include two industrial hygienists, two industrial hygiene technicians and a statistician.

The results of this study are intended to assist the U.S. Environmental Protection Agency (EPA) with implementation of the Worker Protection Standard (WPS) as it pertains to rose-growing greenhouses.

Outputs:

Preliminary findings suggest that rose harvesters have lower exposure while harvesting during the restricted entry interval than when harvesting after the restricted entry interval has expired. It is thought that this may be due to the harvesters wearing more personal protective equipment while harvesting during the restricted entry interval.

No outputs have been generated to date.

Intermediate Outcomes:

No intermediate outcomes have been generated to date.

End Outcomes:

No end outcomes have been generated to date

External Factors:

The project was initiated based on needs identified by the US EPA.

Future Directions:

No future directions are planned for this project.