

Chapter 6

OCCUPATIONAL HEALTH HAZARDS TO NURSERY WORKERS

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Despite the many laws regulating pesticide use and distribution to protect human health and welfare, pesticides are widely used in small businesses. Officials in the state Department of Food and Agriculture (CDFA) feel there is a need for additional exposure monitoring and assessment of health hazards to nursery workers due to pesticide use (Ochi, 1984). The most critical need in the field is for an accurate database of pesticide type, frequency of use and method of application in local nurseries. Current research indicates a further lack of a single complete list of federally restricted pesticides (Ochi, 1984). The focus of this report is on retail nurseries found in the Berkeley area rather than the larger production-oriented nurseries from which a majority of pesticide illnesses and injuries in the state have been reported. A relatively few studies have been done in both fields. The following is an overview of the current research data, Berkeley's City pesticide plan, U.C. Berkeley's integrated pest management plan, some data assessment difficulties, and some local public informational sources.

The 1983 pesticide illness database shows that a total of 119 illnesses were reported involving nursery or greenhouse workers (State of California, Department of Food and Agriculture, 1984). After investigation, 74 were considered to have some degree of relationship between pesticide exposure and subsequent illness or injury. Twenty-seven of the 74 incidents were classified as "unlikely." Overall, approximately 2500 illnesses and injuries were reported through the California Pesticide Illness Surveillance Program in 1983. Many illnesses and injuries are not reported. The percentage of actual cases reported is unknown.

A Bay area retail nursery owner, when asked about the health hazards associated with pesticide use in nurseries, responded by stating, "We are all one hundred per cent safe because we do not do our own spraying" (anonymous nursery worker, 1984). In this case, a tree specialist was called to perform any tasks which required the use of chemicals. Unless a package was inadvertently broken, there was no apparent direct danger to the health of employees in this particular nursery. Compressed air-sprayers, carried over the shoulder and agitated by movement of the operator, are commonly used in nurseries. If not operated explicitly according to directions, they pose a health hazard.

The City of Berkeley Pesticide Plan (revised by the Subcommittee on Pesticides--composed of four citizens and four city employees--on November 23, 1982) currently permits the use of four pesticides

on City property: Roundup, Daconil, Dursban, and Warfarin (Matthews, 1983). Pesticides proposed for use in Berkeley must first undergo review by U.C. Berkeley's School of Public Health to determine if evidence exists that they can cause cancer, birth defects, mutations or other severe chronic health problems. State CDFA officials who have reviewed the City's plan feel it has severely restricted the use of pesticides in Berkeley (Ochi, 1984).

Previously, DDT, arsenicals, malathion and Sevin were heavily used on university grounds. The first two have since been banned, malathion is particularly foul smelling, and Sevin is highly destructive to non-pest species (Soloway, 1981). University of California, Berkeley's Pest Control Supervisor, Art Slater, recalls only one incidence, which occurred several years ago, when an employee of the Environmental Health and Safety Division was involved in an organophosphate pesticide accident. Correct action was taken subsequent to the accident and the victim suffered no serious health damage (Slater, 1984). Slater designed the Integrated Pest Management (IPM) Program used on campus to control mice, rats, cockroaches, bacterial and fungal infestations and various parasites of trees and shrubs. The IPM program draws on chemical, biological and cultural techniques as needed to bring pests under control.

Data available to the public in general should be verified through in-depth research whenever possible. One former researcher, consultant to the University of San Francisco and Environmental Protection Agency (EPA) consultant, cautioned against accepting research results published in popular journals as methods of data collection have been found fallacious (Slater, 1984). Further, one research associate specializing in urban pesticide issues at Citizens for a Better Environment (CBE) and entomologist at the University of California, Berkeley feels CDFA statistics should be reviewed with discretion (Dreistadt, 1983). The CDFA Worker Health and Safety Unit acknowledges a need for improvement in data evaluation methods in general, but more so in the larger Department of Industrial Relations (Ochi, 1984). In a report issued by CBE in 1981, a search of Alameda County agricultural files revealed the illegal use of pesticides by cities and public agencies in the county more than 50 times within a two-year period. Alameda County Agricultural Commissioner Michael Green was unaware of the illegal use of Lindane and Sevin ("restricted" pesticides which have been shown to be the cause of chronic health effects) by the City of Oakland and California Department of Water Resources without a required county permit (Watt, 1981).

A label on any pesticide container is a legal document. Using pesticides in a quantity greater than the amount specified, not following storage and disposal instructions, or recommended application procedures, is therefore a violation of California law. Unfortunately, it is known that lay persons are commonly erroneously advised by nursery employees to use pesticides for uses other than which they were intended (Robinson, 1983). Homeowners often mistakenly use more than the recommended amounts (which are specified to prevent accumulation of hazardous quantities of residues)

in the belief that "if once is good, twice is better" (Robinson, 1983). Another common fallacy involves the relative degree of toxicity of hazard of active and inert ingredients (active: essential component that actually controls the pest, produced in the manufacturing plant; inert: carrier for effective delivery and binding agent mixed with active ingredient at formulating plant). The percentage by weight of ingredients and effectiveness of respective ingredients in controlling pests is not necessarily a measure of toxicity. Clearly, one limitation in the assessment and monitoring of pesticide exposure health hazards and the development of an accurate database is determining the extent to which label instructions are understood and followed. Despite the lack of enforcement pathways, there are no educational requirements for permitted operators and there have been no moves to improve pre-permit educational or testing requirements.

Several medical and environmental studies have been published indicating some uncertainty in determining and isolating the factor(s) responsible for long-term health effects suffered by pesticide-exposed individuals (Crocker, 1984). The Farm Chemicals Handbook (Meister, 1980) and the Merck Index (Windholz, 1976) are two reference publications which supply to agriculturalists information about the uses and formulations of pesticides. The EPA, ABAG, Berkeley Public Library, U.C. Agricultural Extension all make available to the general public information regarding non-chemical alternatives to pest control.

In summary, very little research has been done in the field. Clearly, steps need to be taken to identify where hazards are to pesticide-exposed nursery workers and to determine the feasibility of proposed improvements in worker safety. In addition to the county agricultural commission, the following agencies should be notified if a substantial hazard exists and need for a change in work conditions has been established: Department of Industrial Relations--Industrial Safety, County Health Officer or Department of Health, and Department of Agriculture. The following Bay area organizations may be interested in formulating a database of nursery worker illnesses and injuries, pesticide type, quantity and frequency of use in local retail nurseries: the EPA, the Association of Bay Area Governments (ABAG), the County Agricultural Commission, the Office of Appropriate Technology and the Farm and Home Advisor.

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APPENDIX TO SECTION IV.B.
BERKELEY SMALL BUSINESS SURVEY FORM

City _____
4 digit SIC _____
Interviewer _____
Date _____

QUESTIONNAIRE - PERSONAL INTERVIEW
Hazardous Waste Disposal From Small Businesses

Thank you for taking the time to participate in our survey. As I mentioned on the telephone, we are gathering information on businesses that may be generating "small" amounts of hazardous waste. (Interviewer note: By small, we mean less than about one ton of hazardous waste a month.)

I would like to emphasize that this survey is not designed for enforcement purposes. The cover page will be detached from your answers, which will be analyzed along with other businesses such as yours. We are not interested in your specific facility, but rather in obtaining a profile of your industrial group.

GENERAL INFORMATION

1. Would you please describe the services, production processes or products provided at this facility? (verify SIC code)
2. How many full-time employees work at this facility?
How many part-time employees work at this facility?
3. How much land does your operation occupy? _____ acres.
How much floor area do you have? _____ sq. ft.
4. How long has this business been in operation?
- *5. What is your yearly production or the amount of goods processed/serviced (e.g., number of items dry cleaned, lbs./mo.)?
Average _____
Range _____

HAZARDOUS MATERIALS

Hazardous materials or wastes are generally defined as having one or more of the following characteristics: flammable, corrosive, reactive, explosive, cancer-causing or toxic.

- 6a. What type of hazardous materials do you use in your business?
b. About how much do you use each month?
a. Material b. Quantity/month
- 7a. What types of empty hazardous material containers are generated?
b. What are the sizes of these containers?
c. How many containers are empties each month?
a. Type of Container (e.g., bags, drum) b. Size Container c. Number/month

For the purpose of this survey, wastes include liquid, solid, sludge or contained gases that are stored, treated, disposed of or recycled.

- 8a. What processes generate hazardous waste? (include treatment, recycling)
- b. What hazardous waste do they generate?
- c. What is the estimated concentration of the waste? (% or ppm)
- d. About how much is generated each month? (lbs./gal.)

*Questions throughout survey to be tailored for each SIC selected for the survey.

- e. How are these wastes stored?
- f. How do you dispose of these wastes?

Questions to be tailored for each SIC selected for the survey.

- | | | |
|-----------------|---|--|
| <u>Storage</u> | a. container on shelf | f. fixed storage tank, below ground |
| | b. barrels (not steel) | g. sump |
| | c. steel drum | h. pit, pond, lagoon |
| | d. plastic encased | i. unknown |
| | e. fixed storage tank, above ground | j. other (specify) |
| <u>Disposal</u> | a. sewer | f. transported to dump/landfill |
| | b. septic tank | g. transported to hazardous waste facility |
| | c. ground around business | h. recycle off-site |
| | d. picked up with community trash | i. received by chemical manufacturer |
| | e. transported to hazardous waste transfer facility | j. unknown |
| | | k. other (specify) |

- 9. Does the amount of waste generated by your operation change seasonally?
Yes ___ No ___
If yes, when do peaks occur? ___ troughs? ___
(Please specify time period)
- 10. Are hazardous wastes mixed or diluted in storage? Yes ___ No ___
If yes:
 - a. What wastes are mixed with other substances?
 - b. What substances are mixed with the waste?
 - c. Could the waste be kept separate for recycling? (Yes/No)
- 11. Do you store any obsolete, used or off-grade chemicals you do not intend to use? Yes ___ No ___
If yes: What obsolete substances do you store?
How much of these materials do you store?
- 12. Do you have an emergency plan for spills, leaks or accidents? Yes ___ No ___
If yes, explain:

(Interviewers note: If no wastes are disposed of off-site [from question 8], skip to question 17. Check all answers that apply for questions 13-16.)

- 13. How are hazardous wastes transported off-site?
 Company vehicle
 Contracted hazardous waste hauler
 Community trash pick-up
 Other _____
- 14. How are wastes contained for shipping?
 Steel drums Dumpsters
 Lab packs Other _____
- 15. How are haulers of your hazardous wastes informed of the contents?
 Not informed Other shipping papers
 Notified verbally Containers are labelled
 Hazardous Waste Manifest Other _____
- 16. How are off-site treatment and disposal facilities informed of the waste content?
 Not informed Other shipping papers
 Notified verbally Containers are labelled
 Hazardous Waste Manifest Other _____

REGULATIONS

- 17. Are you familiar with the federal and state regulations on hazardous waste?
Yes ___ No ___ Somewhat ___
- 18. If you dispose of more than 500 lbs. of hazardous waste annually, you are required by law to notify the State Board of Equalization. Do you have or have you applied for a hazardous waste permit from the California Department of Health Services?
Yes ___ No ___

19. Do you have a special wastewater discharge permit from your local sanitary district?
Yes _____ No _____

ECONOMIC CONSIDERATIONS

20. What are the approximate capital and operating costs which can be attributed to the treatment and disposal of hazardous wastes? (If possible, please provide a cost breakdown by individual wastes.)

	<u>Capital \$</u>	<u>Annual Operation \$</u>
Treatment	_____	_____
Disposal	_____	_____

21. What are the total annual sales for your business? _____

OPTIONS FOR FUTURE DISPOSAL PROGRAMS FOR SMALL GENERATORS OF HAZARDOUS WASTE

22. There are several options for disposing of hazardous waste. Would you please tell us whether you would definitely use each service, might use each service, or would not use each service.

	<u>Would</u>	<u>Might</u>	<u>Not</u>
a. A service that would come to your business to recycle your waste and return it in a useable form.	_____	_____	_____
b. A service that would come to your business to collect your hazardous waste.	_____	_____	_____
c. A permanent collection site/transfer facility for disposal of hazardous waste?	_____	_____	_____
d. A community "Dump Day" where you would take your hazardous waste to a special location, where it would be properly packaged and taken for recycling, treatment or disposal.	_____	_____	_____
e. Participate in a hazardous waste exchange	_____	_____	_____

(Interviewer note: If answered "would not" to all of question 22, skip to question 24.)

23. How much would you be willing to pay for these services?

- _____ More than \$500 per month
- _____ \$200-\$500 per month
- _____ \$100-\$200 per month
- _____ \$50-\$100 per month
- _____ \$25-\$50 per month
- _____ Less than \$25 per month
- _____ Nothing

24. Do you have any suggestions for disposal programs that would satisfy your needs?

That's it. Thank you very much for your time. It has been very helpful talking with you today.

(General interviewer comments):