Chapter 12
Pesticides as an Occupational Hazard Facts and Figures

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ABSTRACT

The chapter gives insight into the harmful use of pesticides in different professional environments. It portrays the use of pesticides as the potential risks to the health of users and third parties and a danger to the environment. The use of pesticides has increased at a phenomenal rate. Pesticides and their threat to the biological world have reached almost hysterical proportions. Their residues are found everywhere, particularly those of the so-called "hard pesticides" or organochlorine compounds, DDT. Herein, an attempt has been made to reflect pesticide exposure in different occupational settings and their harmful effects on humans. Excess use of pesticide in agriculture has placed workers in this industry at risk of lethal exposure. Personnel working in domestic pest control service is also from continuous exposure to the pesticide. Further, the chapter highlights various corrective measures to be taken by the people working in different occupational settings to combat the dangerous effects of pesticides in everyday life.

INTRODUCTION

Fungicide, Federal Insecticide and Rodenticide Act (FIFRA) (US EPA, 1947) define "Pesticides are substances or mixtures intended for preventing, destroying, repelling, any insects, rodents, nematodes, fungi or any other forms of life declared to be pests; designed for use as a plant regulator." Pesticides consist of various categories of toxins. Pesticide-related health effects can be acute or chronic. The duration of exposure, the dose of exposure and the route helps in determination of the severity of health effects. The intention of use defines pesticide validity as per the FIFRA. For example, bleach is used differently in

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different places, viz as a (disinfectant) in bathrooms (Figure1), floors or tissue culture room (Figure 2) but it is not considered a pesticide when it is used for whitening of clothes. The United States uses over 1/4th of the world's total pesticide. It is the biggest pesticide hub for 4.5 billion pounds of chemicals per year required for the manufacture of 890 active ingredients, which are packed commercially into 30,000 formulations. 75% of pesticides used in agricultural settings and the rest 25% of structural fumigation, homes, gardens, hospitals, etc. In England, indiscriminate use of pesticides caused a reduction in the number of birds in gardens and farmland. An Indian Press Report (http://www.organicconsumers.org/Toxic/pepsi_coke_pesticides.cfm) confirmed the presence of high level of pesticides and insecticides such as lindane, DDT, malathion, chlorpyrifos in twelve popular soft-drink brands. The Food and Agriculture team of Greenpeace claimed that tea sold by some biggest tea brands in India contained pesticides. The team tested 49 samples, out of which 46-tested positive for one or more pesticide. The statistical data collected from vegetable samples of local vendors from different parts of the city Pune, India were inspected. A few samples revealed the presence of residues of banned pesticides such as DDT, chlordane, captafol, and carbofuran. The demands for imported chemicals by developing countries have extensively increased the value of pesticide purchase by Third World countries (World resources, 1986). Pesticide use in public health care and agriculture has impacted the lives of human. Reports from Central America suggested that large-scale spraying of DDT on cotton developed resistance to the pesticide in Anopheles, a malaria vector (Chapin & Wasserstrom, 1981). Further, in recent years, the number of reports of mortality and human poisonings due to pesticides are growing (Foo, 1985). The most glaring problem faced today in developing countries is the presence of organochlorine residues in foodstuffs like in poultry, red meat, and vegetables in Nigeria (Atuma, 1985), eggs in Kenya (Mugambi et al., 1989), and potatoes in Egypt (Lakwah et al., 1989). These residues get detected in human milk. A survey in Third World countries revealed levels of organochlorine residues in milk samples of nursing infants were greater than the acceptable daily intakes proposed by the Food and Agriculture Organization (FAO/WHO, 1988). Apart from the health disaster imposed by pesticide exposure, an environmental disaster is also

Figure 1. Use of bleach as a (disinfectant) in bathrooms