

Illness Associated with Drift of Chloropicrin Soil Fumigant into a Residential Area—Kern County, California, 2003

Chloropicrin is the fourth most commonly used soil fumigant in California. Exposure to chloropicrin causes eye and respiratory tract irritation, vomiting, and diarrhea. . . . This report describes an investigation by the California Department of Pesticide Regulation (CDPR) and the Kern County Agriculture Commissioner (KCAC) into illnesses associated with the offsite drift of chloropicrin in Kern County. A total of 165 persons experienced symptoms consistent with chloropicrin exposure. The findings underscore health risks associated with fumigants and the usefulness of procedures adopted in California to ensure both prompt identification of exposure events and timely notification of the affected public.

On October 3, 2003, an agricultural pest control service began applying 100% chloropicrin at a concentration of 80 pounds/acre to 34 acres of fallow land in Kern County. Chloropicrin was injected 17–18 inches into the soil; a weighted board was used to compact the soil, treating 18 acres. That evening, residents living one quarter mile west of the application site experienced irritant symptoms. The Kern County Fire Department (KCFD) was contacted to investigate; however, darkness, distance from the treated field, and absence of chloropicrin odor prevented firefighters from identifying the source of the irritation. Records from a weather station approximately 7 miles southeast of the application site indicated low wind speeds and stable atmospheric conditions but also that the wind direction had changed that evening, blowing from the field toward the residential dwellings.

The next day, chloropicrin was applied to the remaining 16 acres. A 60-foot, chloropicrin-free buffer was maintained around the perimeter of the field because workers noted a persistent odor when they arrived. Residents one quarter mile west and south of the field complained about irritant symptoms that evening. Residents notified KCFD; several responding firefighters experienced eye irritation. The wind had changed again that evening and begun blowing from the field toward the residential dwellings. Suspecting a pesticide release, KCFD notified KCAC. The field was recompacted, and the odor ceased.

On October 6, KCAC notified CDPR about the incident. KCAC and CDPR conducted in-person interviews at 35 households located approximately one quarter mile west and south of the field and at a day care center; additional interviews were conducted on October 15. The 35 households and day care center had a total of 172 persons present during the exposure period. Representatives from each household and the day care center were interviewed by using a standardized questionnaire. . . . In addition, five workers involved with the fumigation were questioned informally, and KCFD records were reviewed to identify affected firefighters.

The investigation determined that 165 persons reported symptoms compatible with illness caused by chloropicrin; median age of the persons was 16 years (range: 3 months–63 years). Nearly all (99%) had irritant symptoms (e.g., eye or upper respiratory) . . . ; nine (5%) received medical evaluations. Seven had persistent respiratory symptoms when interviewed 11 days after the event. Follow-up medical care was limited because most of the affected persons lacked health insurance.

Source: Adapted and reprinted from the Centers for Disease Control and Prevention. Brief report: illness associated with drift of chloropicrin soil fumigant into a residential area—Kern County, California, 2003. *MMWR*. 2004;53:740.

provides additional information. (Instead of using pesticides, some farmers have been able to control pests by growing several types of crops in the same area at the same time, rotating crops, and applying compost; further discussion of this topic is beyond the scope of this text.)

DIOXINS

The term **dioxin** refers to “a family of chemical compounds that are unintentional byproducts of certain industrial, non-industrial and natural processes, usually involving combustion.”³⁸ The word *dioxin* usually means the chemical TCDD (2,3,7,8-tetrachlorodibenzo-*p*-dioxin),³⁹ which is the most toxic^{40,41} and one of the most widely researched forms of di-

oxin. Researchers have observed that dioxins are among the most toxic chemicals ever used in experiments with laboratory animals.³⁹

Other chemicals that are called “dioxin-like compounds” or simply “dioxins” come from three related chemical families: (1) chlorinated dibenzo-*p*-dioxins (CDDs), (2) chlorinated dibenzofurans (CDFs), and (3) certain polychlorinated biphenyls (PCBs).⁴² A total of 419 compounds in the dioxin family are known to exist; however, scientists regard only about 30 of these as being the most poisonous.⁴⁰

Both natural and human activities produce dioxins. Natural events such as forest fires and volcanic eruptions cause the emission of dioxins into the environment; dioxins that