CALIFORNIA ENVIRONMENTAL HEALTH TRACKING PROGRAM

Agricultural Pesticide Use Near Public Schools in California
Executive Summary

California agriculture produces nearly half of all fruits and vegetables grown in the Unites States. These foods are essential components of a healthful diet and help promote public health here and throughout the country. However, agricultural production frequently relies on the application of pesticides that, under some circumstances, can be hazardous to human health. Compared with adults, children are more susceptible to the effects of pesticide exposure. Because of the potential public health risks to children, we examined the use of selected agricultural pesticides near public schools in the top 15 counties by agricultural pesticide use in California for 2010. Our goals were to improve the methodology for the ongoing surveillance of agricultural pesticides to understand pesticide use patterns and provide information that can be used to assess and inform efforts to minimize potential pesticide exposures among schoolchildren.

In 1990, California established the Pesticide Use Reporting (PUR) program, a world-class system administered by the California Department of Pesticide Regulation (CDPR) to collect and disseminate data on pesticide use. For this study, we utilized the most accurate data available from PUR and other sources to estimate pesticide applications within ¼ mile of school property boundaries. The pesticides included in this study were selected for their public health relevance and categorized based on their known health effects or regulatory status. The six categories of pesticides considered are carcinogens, reproductive and developmental toxicants, cholinesterase inhibitors, toxic air contaminants, fumigants, and priority pesticides for assessment and monitoring. These chemicals, many of which are of regulatory interest in California, are considered in this report to be **pesticides of public health concern**.

For this study, we assessed 2,511 public schools, attended by over 1.4 million students, in the 15 counties with the highest total reported agricultural pesticide use in 2010. We linked geographic school data to over 2.3 million pesticide use records. We found:

- **Most schools did not have any pesticides of public health concern applied nearby.** In 2010, the majority of schools in this study (64% or 1,612 schools) did not have any pesticides of public health concern applied within ¼ mile. For the remaining 36% of schools, pesticide use within ¼ mile ranged from 0.01–28,979 lb.
- **A small percentage of schools had many pounds of pesticides of public health concern applied nearby.**
  - The top 5% of schools with any pesticide use nearby (45 schools attended by over 35,000 students) had amounts of pesticides applied within ¼ mile ranging from 2,635–28,979 lb.
  - The top 25% of schools with any use nearby (226 schools attended by over 118,000 students) had at least 319 lb of pesticides applied within ¼ mile.
- **Pesticide use near schools varied among counties.**
  - Fresno County had the highest number of schools (131) with any pesticides applied nearby, whereas Tulare County had the highest percentage of its schools (63.4%) with any pesticides applied nearby.
  - Ventura County had the highest number of schools (12) and the highest number of students (13,045) in the top 5% of schools. Monterey County had the highest percentage of its schools (8%) and highest percentage of its students (13%) in the top 5% of schools.

- **Hispanic children were more likely to attend schools near the highest use of pesticides of public health concern.** Hispanic children were 46% more likely than White children to attend schools with any pesticides of concern applied nearby and 91% more likely than White children to attend schools in the highest quartile of use.
- **Household income did not consistently differ for children attending schools with the highest use of pesticides of public health concern, compared to schools with no use nearby.** However, differences existed within some individual counties.
- **An estimated 538,912 lb of pesticides of public health concern were applied within ¼ mile of public schools in the 15 counties in 2010.** Of the top 10 pesticides of public health concern used near schools, by pounds applied:
  - The top three pesticides of public health concern were chloropicrin, 1,3-dichloropropene, and methyl bromide.
  - Six are designated by CDPR as "restricted materials," which require special permits and are eligible for additional regulation at the local level.
  - Eight have a chemical persistence (measured as half-life in soil) of more than a week. Only one (chloropicrin) has a chemical persistence of less than 24 hours.
- **Of the pesticides used near schools, many belonged to multiple categories, and use by categories differed.**
  - Of the six categories of pesticides assessed, priority pesticides for assessment and monitoring were used near the most schools (33.8%), while fumigants were used near the fewest schools (12.7%). However, both had similar ranges of use, from zero to over 27,000 lb applied within ¼ mile of a school.
  - Priority pesticides for assessment and monitoring had the greatest poundage (523,566 lb) applied within ¼ mile of all schools, while cholinesterase inhibitors had the lowest (37,455 lb).

This study methodology does not attempt to measure schoolchildren's exposures to pesticides and, therefore, study results cannot be used to predict possible health impacts. Additional information would be needed regarding chemical decay, transport, and routes of exposure, all of which are beyond the scope of this report. However, the study methodology and results can help guide current and future pesticide monitoring and exposure assessment efforts — such as air monitoring, soil sampling, and biomonitoring — as well as epidemiologic studies.

We also hope the study methodology and results will be used by school officials, local environmental and public health officials, county agricultural commissioners, pesticide regulators, exposure assessment scientists, and others to inform policies that may impact public health, such as school-siting decisions and pesticide application permitting regulations.

Overall, we found that the data and technology exist to accurately and efficiently assess pesticide use near potentially sensitive populations with a high degree of geographic resolution. However, some relevant data are not collected and disseminated in a standardized manner throughout California.

In conducting this study, the researchers found a need for:

- Routine and standardized collection, digitization, and reporting of data on agricultural field locations of each pesticide use permit, which could then be made publicly accessible via the PUR system in a format convenient for Geographic Information Systems
- An accurate, complete, and publicly accessible database on pesticides applied on school properties
- An accurate, complete, and publicly accessible database of school property boundaries in California
- Ongoing surveillance of the use of pesticides of public health concern near schools and other potentially sensitive locations, in order to understand trends and usage patterns