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California Study Admits Methyl Bromide Safety Standard Inadequate

Summary

Since March 1996, when the California Legislature moved to overturn the state ban on methyl bromide, the issue of unsafe levels of the pesticide drifting from agricultural fields into nearby communities has grown from a local concern to a statewide controversy. In concert with community groups from across the state, Environmental Working Group has released a series of reports detailing the results of EWG air monitoring and documenting the flaws in methyl bromide safety standards set by the California Department of Pesticide Regulation. These reports have revealed that millions of pounds of methyl bromide are used near schools and daycare centers; that methyl bromide levels exceeding DPR's safety standards are drifting into suburban neighborhoods; and that the health standards issued by DPR are inherently flawed because they are based on faulty assumptions, unsound science and political expediency. (EWG 1996, EWG 1996b, EWG 1997).

Health standards issued by DPR are based on faulty assumptions, unsound science and political expediency.

To every issue raised by our reports, community protests, criticism from public health scientists or inquiries from elected officials, DPR's response has been denial. The agency has repeatedly defended its methyl bromide standards as the toughest in the world, asserted that the chemical is safe when applied according to current regulations and dismissed findings of methyl bromide drift as junk science. But even as DPR has denied that its standards are inadequate, the agency has changed key provisions of its policies governing agricultural use of methyl bromide. Taken together, these actions represent a systematic retreat by DPR and an underlying admission that its safety standards do not adequately protect citizens from exposure to hazardous levels of methyl bromide.

On July 18, DPR released a methyl bromide monitoring study conducted last winter. (DPR 1997). The agency failed to make the study public for five months after the last sample was taken, and then attempted to downplay it by calling the findings "ambiguous" (DPR 1997b). In fact, the findings are clear: At four of six locations, and for three of the four application methods examined, airborne levels of methyl bromide exceeded current safety standards.

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Buffer zones under fire

DPR's strategy for protecting the public from methyl bromide is based on requiring "buffer zones" around fields where the pesticide is used. These buffer zones were calculated not by testing at actual application sites, but by computer modeling with data from experimental fields. Buffer zones are supposed to ensure that no one is exposed to more than 210 parts per billion (ppb) of methyl bromide over a 24-hour period.

But in the last year, the buffer zone model has been repeatedly exposed as flawed:

- After monitoring by EWG and the Castroville-based Farm Without Harm detected elevated levels of methyl bromide up to 1,300 feet from treated fields, DPR finally began a monitoring program in December 1996, and says it will continue through the rest of this year. Before December, DPR had not monitored for methyl bromide drift since 1992.
- In November 1996, after a series of statewide news reports on methyl bromide's impact on communities, and EWG monitoring that found excessive levels of methyl bromide in the backyard of a Ventura daycare center, DPR ordered that buffer zones could no longer include backyards or schoolyards.
- As a result of the findings of its winter monitoring study and intense public scrutiny, DPR has ordered increased safety measures at two upcoming fumigations of what the agency calls "sensitive" sites. Buffer zones will be expanded, treated acreage will be limited, and small test plots will be monitored before fumigating the entire field. In addition, all wintertime buffer zones will be expanded.

Based on EWG experience monitoring methyl bromide, we estimate that sometime during the month of February, DPR had results of its December and January monitoring showing unsafe methyl bromide level outside of buffer zones. Since that time, an estimated 4.9 million pounds of methyl bromide have been applied in California, with no changes in state safety standards. This estimate is based on the average statewide methyl bromide use reported to DPR for the months February through July for the years 1992 through 1994.

An estimated 800,000 pounds of methyl bromide have been applied in the five counties where DPR conducted its test, since the last sample was taken in February 1997; 600,000 pounds in Kern County, 90,000 pounds in Riverside County, 67,000 pounds in San Luis Obispo County, 37,000 pounds in Madera County, and 7,660 pounds in Imperial County.

DPR's winter monitoring report

On July 18, 1997, DPR released the results of methyl bromide monitoring from December 1996 through February 1997. The monitoring was intended to examine the effects of winter weather conditions on the drift of methyl bromide from treated fields. In its report on the winter monitoring project, the DPR states that "higher air concentrations may occur during winter months due to more stable atmospheric conditions" and that methyl bromide buffer zones "may need to be adjusted" accordingly during winter months.

Prior to these tests, DPR assumed just the opposite, namely, that *summer* conditions provided the worst-case scenario for methyl bromide emissions from treated fields. Even so, buffer zone standards have been based on two highly suspect assumptions: uniform statewide average climatic conditions with no variation from season to season, and uniform statewide soil characteristics.

DPR monitored in six locations in Madera, Kern, Riverside, Imperial and San Luis Obispo counties. Four different application methods were employed. More than 200 individual air samples were taken. The results showed:

- **Current buffer zones are inadequate:** Detections of levels of methyl bromide exceeded the “target level” (that is, the state safety standard) of 210 ppb average exposure over 24 hours outside the calculated buffer zones at four of six locations and for three of the four methyl bromide application methods tested.
- **Common application methods can result in unsafe levels of methyl bromide outside buffer zones:** At one location in Madera County, using a common application method, the fumigated field was covered with a special “very high barrier” tarp designed to prevent methyl bromide from escaping. At this site, 24-hour methyl bromide levels exceeded 210 ppb outside the buffer zone at all monitoring stations and on every side of the field. Levels detected ranged from 260 to 990 ppb, nearly five times the standard. The average of the levels detected at the eight sampling sites was 550 ppb, more than twice the standard. These measurements were taken at the edge of the 30-foot buffer zone around the field, a buffer zone distance not uncommon for fields near residential areas. This application method was the same used at the Ventura County site in August 1996 where elevated levels of methyl bromide were detected in the backyard of a daycare center bordering the field. (EWG 1996b)
- **“Hot-gas” method proved too hot to handle:** A newly developed “hot-gas” method of methyl bromide application, where the gas is injected into the field hot through underground drip irrigation lines, resulted in very high levels of methyl bromide release. According to DPR, buffer zones of from one-half mile to a mile will be necessary when this application method is used. In two of three instances when this method was employed, levels of methyl bromide of more than twice the safety standard were detected.

Analysis by county

Riverside County: According to the DPR report, safe levels of methyl bromide in the air were “probably exceeded” at both locations in Riverside County outside DPR-calculated buffer zones. In fact, the data show that safety standards were exceeded at two monitoring stations at Field 2.

Field 1 (25 acres), near Indio, was treated with 220 pounds per acre of a 98 percent methyl bromide/2 percent chloropicrin solution on December 11, 1996. The 24-hour time-weighted average concentration of methyl bromide in the air 330 feet from the field was five times higher than the DPR health standard. Field monitor number 5, located 530 feet from the field, showed 24-hour average levels of 450 ppb, more than two times the

state standard. The buffer zone for this field was 550 ft. This field employed the experimental hot gas application method.

Field 2 (19 acres), also near Indio, was treated on December 12, 1996, with a more conventional tarp-bed application method. The application rate was 195 pounds per acre of 98 percent methyl bromide/2 percent chloropicrin solution applied 12 to 14 inches deep in the soil. At monitoring sites 5 and 6, located 430 feet from the treated field, 24-hour average concentrations measured by DPR are 340 and 405 ppb, respectively, well over the safety standard.

EWG conservatively estimates that actual levels of methyl bromide in the air could be twice as high as those measured by DPR charcoal technology.

Madera County: The test location in Madera County, a 19-acre wine vineyard near the town of Madera, was fumigated on February 6 and 7, 1997. The application rate was 350 pounds per acre of 98 percent methyl bromide/2 percent chloropicrin solution. Methyl bromide was injected into the soil at a depth of between 10 and 15 inches, and the fumigated field was then covered with a special “very high barrier” tarp designed to prevent methyl bromide from escaping.

Methyl bromide levels measured outside of the DPR buffer zone at this site exceeded the safety standard at all eight monitoring stations on all sides of the treated field. Levels detected ranged from 260 ppb up to 990 ppb, nearly five times the standard. The average of all 24 hour levels from the eight sampling sites was 550 ppb, more than twice the standard.

The application method used on this field is commonly used across the state and was, until this study, considered one of the safest in terms of emissions. The 30-foot buffer zone around the field is also routine for this application method.

Imperial County: This 14-acre field near El Centro was treated on January 27, 1997 with 200 pounds per acre of 98 percent methyl bromide/2 percent chloropicrin solution using the hot-gas method. Like the application at Field 1 in Riverside County, this application resulted in very high levels of methyl bromide release. Levels up to 2.5 times the safety standard were detected on three sides of the field at five of eight sampling locations.

Kern County: This field, near Arvin, was also fumigated using the hot-gas method. Methyl bromide was applied on January 20, 1997 at 200 pounds per acre in a 98 percent methyl bromide/2 percent chloropicrin solution. No sampling sites around this field exceeded the 210 ppb level when averaged over 24 hours. However, two sites at 360 feet from the field had levels of 220 and 160 ppb for 18 hours straight. Seven other samples taken at 360 feet found levels ranging from 40 to 87 ppb.

San Luis Obispo County: The final site monitored was a 10-acre field near Santa Maria, treated with 400 pounds per acre of 50 percent methyl bromide/50 percent chloropicrin solution on February 13, 1997. This site used a tarped shallow-injection application method, involving injection of methyl bromide at a depth of 10 to 15 inches, while the soil was covered with a tarp. No sampling site detected levels exceeded the 24-hour

safety standard, with recorded levels of methyl bromide at 30 feet of 6 to 82 ppb. It should be noted that at this site, unlike all the others, a mixture of 50 percent methyl bromide/50 percent chloropicrin was used.

Additional problems with DPR safety standards

- **Monitoring methodology flawed.** The monitoring equipment used by DPR in this study employs outdated charcoal-tube technology that routinely fails to capture and retain significant amounts of methyl bromide in the ambient air. DPR's report addresses this issue, and as much as admits that charcoal tube monitoring may not detect much of the methyl bromide present in the air at a given site.

According to DPR, the agency "spiked" charcoal recovery tubes with a known amount of methyl bromide but then could only detect about three-fourths of the chemical. DPR further notes that actual detection in the field may be less, because the samples were spiked with liquid methyl bromide, "which may not indicate the performance for samples containing methyl bromide in gaseous form."

EWG conservatively estimates that actual levels of methyl bromide in the air could be twice as high as those measured by DPR charcoal technology. EWG side by side monitoring with charcoal tubes and more sophisticated SUMMA canisters showed that under field conditions charcoal tubes may fail to detect 90 percent of the methyl bromide in the ambient air (EWG 1997).

- **DPR's safety levels outdated:** California's 24 hour safety standard for exposure to methyl bromide from agricultural use is 210 parts per billion (ppb). This standard was derived from animal toxicology studies that DPR now recognizes as inadequate. Worse, the standard has not been revised despite more recent studies accepted as valid by the DPR indicating the extreme toxicity of methyl bromide. These newer studies, in the DPR's possession since 1993, indicate that an appropriate safety standard for methyl bromide is about 10 ppb, or 20 times less exposure than allowed currently.

When methyl bromide is used for home fumigation in California, the 24 hour exposure standard (Proposition 65 "warning level") is 15.5 ppb, a level 13 times more protective than the standard applied to agricultural drift. There is no scientific basis for allowing 13 times more methyl bromide exposure outdoors than indoors, and the net result of this double standard is absurd: Californians can be legally exposed to 13 times more methyl bromide on their front porch than in their living room.

The U.S. Public Health Service recommends a 24 hour exposure standard for methyl bromide of 50 ppb.

When methyl bromide is used for home fumigation in California, the 24 hour exposure standard is 13 times more protective than the standard applied to agricultural drift.

References

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