# **Pesticide Drift** Inadequate protections for California families

From their front door, Manuel Silveira and his wife Susie can watch tractors applying fumigant pesticides in the strawberry fields. Their family lives just feet from one of the many commercial strawberry nurseries covering a third of the Bend District in Tehama County, California.

Along with neighbors, the Silveiras have grown increasingly concerned about the health impacts of fumigants drifting from the fields. "We've all exchanged stories of burning eyes from the chemical drift, tarps ripping off," said Manuel. "We have anxiety over the real and possible danger of exposure for us all, especially our children and grandchildren."

In 2008, alarmed by the smell of chemicals in the air during fumigation, Manuel contacted the Tehama County Agricultural Commissioner. He asked that buffer zones be created between the fumigant application sites and the schools and backyards where children play.

### Fumigants: A real and present danger

Across California, communities and farmworkers live, work and play in close proximity to strawberry fields — sometimes just a few feetfrom where pesticides are applied. Strawberry seedlings are commonly grown in nurseries in the Sacramento Valley and then transported to the Central Coast for fruit production. In many cases, hundreds of pounds of pesticide fumigants are used to sterilize each acre of soil.

Methyl bromide and chloropicrin are some of the most commonly used fumigants in California. Chloropicrin is commonly mixed with most other fumigants, including the recently approved cancercausing methyl iodide. And scientists, as well as communities, are very concerned.

Due to the likelihood of pesticide drift, fumigants — like chloropicrin — are inherently unsafe and difficult to control. And, unfortunately, fumigants are poorly monitored and laws are poorly enforced.

Local and state officials need to create better policies — and enforce existing policies — to protect Californians from harm.

Recently reported mass fumigant poisonings in California:

- Monterey 2008: 25 people sickened by metam sodium
- San Bemardino 2006: 26 sickened by chloropicrin
- Monterey 2005: 204 sickened by chloropicrin
- Salinas 2005: 60 + sickened by chloropicrin
- Kern 2003: 193+ sickened by chloropicrin
- Lamont 2003: 235 sickened by chloropicrin

He was told that a legally mandated buffer zone was already in place—a 60-foot barrier between the edge of the fumigation site and a non-agricultural property. Furthermore, Driscoll's the company that owns and operates strawberry nurseries in the area—was complying with regulation and fumigating the soil with a mixture of methyl bromide and chloropicrin as directed. According to the Commissioner's office, there was no proof that drift was occurring beyond the buffer zone.

Between 2003 and 2008, 561 Californians reported illness related to drift from chloropicrin alone. The reported incidents are believed to represent only a fraction of the true number of poisonings.



Buffer zone between residential proper tyand tarped strawberry fields.

From living next door, Manuel and his neighbors knew the 60-foot buffer zone wasn't providing enough protection; from personal experience, and research into similar situations, they suspected that heavy use of fumigants in the area was exposing them to serious health harms, including increased risk of cancer.

The situation in Tehama is not unusual. Applying fumigant pesticides is dangerous and unsustainable, and many communities like Manuel's have been poisoned by drift. While some of these incidents were caused by applicator's mistakes, there are numerous examples where the fumigation was conducted according to legal requirements and people's health was still jeopardized. In some cases, poisonings occurred a half-mile or more from the fumigation site, far beyond the 60-foot buffer zone required for methyl bromide applications.

## The Bend community takes action

To address the issue of pesticide drift, Manuel and his neighbors created Healthy Tehama Farms (HTF), a group dedicated to promoting farming practices and fostering healthy community. After first approaching Driscoll's and urging the company to stop using pesticide fumigants and transition its operation to organic—which the company declined to do—HTF turned its focus to air sampling and monitoring for the presence of drift over the areas they live, work and play.

HTF enlisted the help of Pesticide Action Network (PAN). Scientists from PAN provided air-monitoring equipment— "Drift Catchers"— and conducted rigorous trainings with the community in air sampling techniques. A Drift Catcher works like a vacuum cleaner, sucking air through tubes packed with absorbent resin that traps pesticides. The tubes are then sent to an independent lab for analysis. Knowing that a fumigation would take place in the fall of 2011, Manuel and his family put three Drift Catchers along the west edge of the field to determine whether or not methyl bromide and chloropicrin were drifting into his yard. The first Drift Catcher was stationed in the shared neighborhood garden, the second next door in his grandchildren's sandbox, and the third was in Manuel's front yard.

In total, they collected 24 air samples (eight from each site) from Nov. 4 through Nov. 11, 2011. The fumigation took place on Nov. 4, and the tarps were removed on Nov. 10. A total of 1,755 lbs. of a methyl bromide and chloropicrin mixture were applied to a fiveacre section of the strawberry nursery, at a rate of 351 lbs. per acre. The samples were analyzed for only chloropicrin.

Fourteen homes are located alongside this field, where 17 children under the



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#### Fumigants are widely used across the state

In 2010, over 34 million pounds of fumigants were used in California, putting many communities like Manuel's at risk. That same year, 5.8 million pounds of chloropicrin and 3.8 million pounds of methyl bromide were applied across the state. In Teha ma County alone, over 99,000 pounds of methyl bromide were applied in 2010.





Residents of the Bend community placed Drift Catchers in their yards to monitor air quality during pesticide fumigations of adjacent strawberry fields. The California DPR has participated in scientific reviews of the Drift Catcher and the U.S. EPA has used previous Drift Catcher results to assess exposure and risk for several chemicals.

#### Chloropicrin is a potent carcinogen

In February 2010, the California Department of Pesticide Regulation concluded that chloropicrin is a very potent carcinogen. Using the Department's cancer potency factor and standard methods for estimating cancer risk, PAN scientists calculated that if the exposure to chloropicrin at the levels detected were to occur every year, 151 excess cases of cancer would occur per one million people on average over a lifetime (see table below). Even a two-year old exposed only during those two years of life would have a risk of getting cancer that was 76 times higher than the state's acceptable cancer risk of one in a million.

age of 12 live. There are over 90 homes within a half-mile of the fumigated property.

### High levels of pesticide drift found near homes

The Drift Catcher results paint a troubling picture. Manuel, his grandchildren and neighbors were breathing high levels of chloropicrin continuously during the tested time period, with all samples at all sites showing fumigant drift. The timeweighted average 24-hour chloropicrin levels at each site were all nearly twice as high as the level determined to be acceptable for a 24hour exposure for children (6.2 µg/ m<sup>3</sup>) by the scientists at the California **Department of Pesticide Regulation**, the Scientific Review Panel and scientists at the California Office of **Environmental Health Hazard** Assessment. The time-weighted average concentrations over eight days were 5.8-6.7 times higher than the U.S. EPA's short-term (1-30 days) Reference Concentration of 1.8 µg/m<sup>3</sup> for children and 4.4-5.0 times higher than the comparable California DPR Seasonal Reference Concentration.

These numbers indicate an una cceptably high risk for both children and adults who not only experienced these high levels of toxins in their air, but did so for *eight continuous days.* Even more troubling is that the actual chloropicrin concentrations were probably much higher than those determined in the Drift Catcher experiment, because the amount of chloropicrin in the air exceeded the absorption capacity of the sample tubes for most samples.



Figure 1: Time weighted average concentrations of chloropicrin over eight days of sampling exceeded DPR's seasonal Reference Exposure Level (REL) by a factor of 4.4-5.0. Maximum concentrations were between 1.7 and 1.9 times higher than DPR's 24-hour Reference Concentration (RfC) for children.

### Chloropicrin Concentrations and Cancer Risks in Tehama County

	Garden	Sandbox	Front Yard	Average
Number of samples	8	8	8	8
Percentage of samples with chloropicrin above DPR's seasonal REL* of 4.9 μg/m <sup>3</sup> for adults	50%	100%	100%	83.3
Maximum chloropicrin level found (µg/m³)	24.5	16.4	26.8	22.6
Time-weighted average level of chloropicrin over eight-day sampling period (µg/m³)	10.9	10.6	12.1	11.2
Excess cancer risk per million people (lifetime exposure)	147	143	164	151
Excess cancer risk per million for two-year- olds exposed for only two years	74	72	82	76

\* DPR's season al Reference Exposure Level (REL) is for exposure time period so f 7 d ays to 6 months.

## **Too hazardous for California communities**

#### Fumigants are inherently unsafe

Fumigant pesticides are unique in that they are highly toxic and volatile. They are also applied at much higher rates than typical pesticides. The same properties that make them powerful agents for sterilizing soil also render them extremely hazardous to the workers applying them and to the people living, working or playing near treated fields. Additionally, many are known or suspected to cause cancer. Some are also endocrine disruptors and also cause problems with pregnancy, including miscarriage.

The main fumigants used in California agriculture are methyl bromide, chloropicrin, 1,3-dichloropropene (Telone) and metam sodium. Methyl bromide is currently slated for an international phaseout under the Montreal Protocol because of its ozone-depleting properties but is still being used during the phaseout period. "Critical-use exemptions," like the exemption granted for Driscoll's strawberry nurseries in the Bend, will likely continue to be issued through 2015.

#### New fumigant methyl iodide is not a better solution

Next fall, the strawberry farm next to Manuel and Susie's will have the choice of using a new fumigant, methyl iodide. Arysta LifeScience has marketed it as a safer substitute for methyl bromide, despite the fact that methyl iodide has been called "one of the most toxic chemicals on earth" by scientists.

Under industry pressure it was approved for use by the U.S. EPA in 2007, and in California in December 2010.

Methyl iodide was approved despite objections from many prominent independent scientists around the country including six Nobel laureates—who warned that using methyl iodide would put people at "serious risk," especially pregnant women, children and farmworkers.

California's decision to approve methyl iodide for use as a soil fumigant puts communities like the Bend at risk not only for cancer and acute poisonings, but also for late-term miscarriage and ground water contamination.

### **Time for better solutions**

For years, farmers in California and around the world have successfully grown strawberries without the use of methyl io dide. Whether a small or large operation, furnigant pesticides are not required to grow strawberries. Large and small operations alike are proving that safer, more sustainable pest control methods work.



Organi c strawberry farmer Jim Cochran at his farm outside Santa Cruz, California.

Communities in California are calling on the Brown Administration and newly-appointed Director of Pesticide Regulation, Brian Leahy, to protect people who live, work and play near strawberry fields by taking the following steps:

- Reverse the decision to register of methyl lodide as a furnigant pesticide, given findings of DPR's external Scientific Review Committee, and Drift Catcher results.
- Support alternatives to the use of fumigants and establish a multi-stakeholder, inter-agency panel charged with creating a plan to end reliance on fumigants within the next five years.
- Create substantial interim buffer, or protection zones, to protect workers and communities from hazards of pesticide drift, until fumigants are phased out.

