Chloropicrin Mitigation

California Department of Pesticide Regulation
Worker Heath and Safety Branch
Human Health Mitigation Program
Overview

- Background
- Chloropicrin Use Patterns
- California Strawberry Production
- Increasing Use of Chloropicrin
- Discussions with CAC Staff
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Background

U.S. EPA

- Completed risk assessment in 2006.
- Published RED in 2008.
Background

U.S. EPA

- Using a phased-in approach to ensure mitigation measures required for re-registration are incorporated.
- Phase I product labels took effect in 2011.
- Phase II label changes expected to be completed before the major use season in 2013.
Background

U.S. EPA

- Phase I included use limitations, GAP’s, FMP, handler training requirement, respiratory protection and stop work triggers for handlers.

- Phase II includes certified applicator training requirements, acreage limitations, buffer zone distances, credits, and posting requirements, and emergency preparedness and response requirements.
Background

CDPR

- In 2001, placed into re-evaluation, requiring chloropicrin registrants to conduct and submit results of worker exposure studies and air monitoring studies.

- In 2010, completed risk assessment (bystanders and residents only).
In 2010, a Risk Management Directive set regulatory target level to restrict acute exposure at 73 ppb averaged over 8 hours.

WHS directed to develop mitigation measures to protect residents and bystanders from acute exposure.
Background

CDPR

- Designated a TAC in 2011.

- Convened TAC workgroup, and met with workgroup in April and July 2011, and in July 2012.

- Determined that we would spend a year researching chloropicrin uses.
Chloropicrin Use Patterns

- Average use last 5 years about 5,627,000 pounds/year.

- The highest monthly uses occur in August, September, and October (~ 19%, 33% and 23% of the total annual use, respectively).
Chloropicrin Use by Month (2006-2010)

Source: Pesticide Use Report (CDPR, 2012)
Chloropicrin Use Patterns

- Primarily used for pre-plant soil fumigation for strawberries, nurseries, raspberries, peppers, tomatoes, and melons.

- Strawberries account for about 70% of all use.
## Chloropicrin Use Patterns

<table>
<thead>
<tr>
<th>COUNTY</th>
<th>AVERAGE POUNDS OF CHLOROPICRIN</th>
<th>PERCENT AVERAGE TOTAL ANNUAL USE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monterey</td>
<td>1,143,877</td>
<td>20.3</td>
</tr>
<tr>
<td>Ventura</td>
<td>1,157,825</td>
<td>20.6</td>
</tr>
<tr>
<td>Santa Barbara</td>
<td>507,594</td>
<td>9.0</td>
</tr>
<tr>
<td>Santa Cruz</td>
<td>418,513</td>
<td>7.4</td>
</tr>
<tr>
<td>Siskiyou</td>
<td>246,746</td>
<td>4.4</td>
</tr>
<tr>
<td>TOTAL</td>
<td>3,474,554</td>
<td>~62%</td>
</tr>
</tbody>
</table>
CA Strawberry Production

• More than 80% of production for USA.

• Grown on ~ 40,000 acres.
CA Strawberry Production

- The majority of commercial strawberry plants originate from one of several breeding programs.

- Strawberry improvement program located at University of California, Davis focuses on cultivar development for the California strawberry industry.

- Fruit production primarily on central and southern coast, so UCD cultivars are developed specifically for these climates.
CA Strawberry Production

- Every year, UC strawberry breeders submit plants to UCD.

- These plants are treated using heat and tissue culture techniques to eliminate virus.

- New plant varieties are licensed directly to plant nurseries.
CA Strawberry Production

- Nursery purchases a small number of mother plants from UCD and propagates these in screenhouses in Central Valley.

- Propagated daughter plants are harvested and sent to a second nursery for further propagation in a small acreage fields.

- These propagated daughter plants are harvested and sent to Siskiyou County, where the required number of daughter plants are grown to fulfill grower orders.
CA Strawberry Production

- Daughter plants are harvested, bundled, refrigerated and shipped for field planting and fruit production.

- Harvesting operation occurs in September – October, depending on when planting occurred.

- Siskiyou harvesting schedule is a driving force on when strawberry growers need to have fumigations completed and ground ready to be planted.
Increasing Use of Chloropicrin

- There has been an increased use of chloropicrin over the years due to unavailability of methyl bromide and 1,3-D.

- Applications made with formulations containing less methyl bromide and more chloropicrin.

- Applications made with 100% chloropicrin when 1,3-D cap exceeded, or when methyl bromide is unavailable.
Increasing Use of 100% Chloropicrin

Total Pounds 6 Year Period: 4,920,988
Increased use of Chloropicrin

![Graph showing increased use of Chloropicrin products](image-url)
Discussions with CAC Staff

- Talked with CAC staff from various counties to learn of any issues they were facing with chloropicrin applications:
  - Merced
  - Santa Cruz
  - Tehama
  - Shasta
  - Del Norte
  - Modoc
  - Lassen
  - Siskiyou

- Modoc and Del Norte do not use chloropicrin.

- Major issues in other counties are 1,3-D cap, cost of tarp, availability of water, and wind issues.
Discussions with CAC Staff

- Observed applications in:
  Merced
  Monterey
  Santa Barbara
  Santa Cruz
  Siskiyou

- Still need to observe shank bedded application, and have tentatively scheduled observation for mid August.
Discussions with CAC Staff

- Monitoring of TIF tarp cutting and tarp pulling operations.

- Conducted monitoring at two sites.

- Both showed very little chloropicrin in the breathing zones of the workers.
Mitigation Concepts Under Consideration

- Buffer Zones – will develop DPR-specific buffer zones and compare with what EPA has developed.

- Tarp requirements – totally impermeable film (TIF) required for 100% chloropicrin applications.

- Notification requirements – for 100% chloropicrin applications, require notification similar to what is in 3CCR 6447.1 for methyl bromide applications.

- Limit time of applications for all fumigant applications – limitation would be the same as written for metam in 3CCR 6450.1(c): “Fumigations must start no earlier than one hour after sunrise and must be completed no later than one hour before sunset”.
What’s Next

- Complete review of Phase II product labels.
- Continue meeting with TAC, Worker Advocate, and industry workgroups to solicit comments on proposed mitigation concepts, and to gather additional suggestions for mitigation.
- Complete draft mitigation proposal for management review by December 2012.