Chloropicrin Mitigation Proposal
Resident and Bystander Acute Exposure From Soil Fumigation Applications

June 2013
Outline

• Background
• EPA mitigation
• Additional DPR proposed mitigation
  – Buffer zone development
  – Buffer zone distances – tables, minimums
  – Emergency preparedness and response
  – Notice of intent
  – Maximum acreage and field separation
  – Buffer zone duration and tarp cutting interval
• Concluding remarks
Background: description of chloropicrin uses

- Primarily used for pre-plant soil fumigation for strawberries, nurseries, raspberries, peppers, tomatoes, and melons
  - Strawberries account for 70% of all use
  - Used for treatment of soil-borne insect pests, nematodes, fungus, and some weeds

- Can be injected into the soil or applied through drip irrigation, and usually covered with a tarp
Background: description of chloropicrin uses

- Five counties account for majority of use (data from 2008 – 2011)

<table>
<thead>
<tr>
<th>County</th>
<th>Yearly Average Chloropicrin (pounds)</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ventura</td>
<td>1,749,327</td>
<td>28.2</td>
</tr>
<tr>
<td>Monterey</td>
<td>1,646,761</td>
<td>26.6</td>
</tr>
<tr>
<td>Santa Barbara</td>
<td>804,167</td>
<td>13.0</td>
</tr>
<tr>
<td>Santa Cruz</td>
<td>472,077</td>
<td>7.6</td>
</tr>
<tr>
<td>Siskiyou</td>
<td>396,896</td>
<td>6.4</td>
</tr>
<tr>
<td>All other counties</td>
<td>1,127,872</td>
<td>18.2</td>
</tr>
</tbody>
</table>
Background: use requirements - overview

- Use of all pesticides, including chloropicrin, must comply with product label requirements

- Chloropicrin is a restricted pesticide under federal and state laws
  - Applications must be supervised by certified applicator
  - A restricted materials permit must be obtained from county agricultural commissioner

- Agricultural commissioners have implemented permit conditions which vary from county to county, based on local conditions
Background: risk assessment

• As required by federal and state laws, DPR and EPA evaluated potential health hazards
  – Toxicology data evaluated
  – Exposure data (air concentrations) evaluated
  – Eye and respiratory irritation most sensitive potential toxic effect
  – CA illnesses investigated by agricultural commissioners and DPR

• EPA risk assessment completed in May 2009

• DPR risk assessment completed in 2010, designated as a toxic air contaminant in January 2011
Background: risk management

- EPA mitigation implemented
  - Phase 1 (Jan 2011): handler protections
  - Phase 2 (Dec 2012): resident and bystander protections

- In Dec 2010 DPR issued a risk management directive to mitigate acute exposure, with a target concentration of no greater than 73 ppb as an 8-hr average for residents and bystanders
  - Mitigation focuses only on use as an active ingredient in soil fumigations
  - Mitigation measures apply to products containing chloropicrin alone, with 1,3-dichloropropene, and with methyl bromide

- DPR used air monitoring data and computer modeling to develop measures that meet the target concentration
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• **EPA mitigation**

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  – Buffer zone duration and tarp cutting interval

• Concluding remarks
EPA mitigation: phase 1 revisions (Jan 2011) – handler protections

- Certain workers designated as handlers
- Handler information requirements
- Handler respiratory protection
- Tarp handling requirements – proposed DPR refinements
- Entry restricted periods
- Good agricultural practices
- Application method and rate restrictions
- Fumigant management plans
EPA mitigation: phase 2 revisions (Dec 2012) – resident and bystander protections

- Certified applicator training
- Community outreach
- Information for first responders
- Buffer zones – proposed DPR refinements
- Maximum acreage – proposed DPR refinements
- Posting requirements
- Emergency preparedness & response – proposed DPR refinements
- Restrictions for difficult to evacuate sites
- Emergency response plan requirements
EPA mitigation: label requirements for buffer zones and related restrictions

• **Allowed activities within buffer zone:**
  – Fumigation handling
  – Transit by vehicles and bikes on roadways

• **Buffer zone distance:**
  – Buffer extends outward from edge of application equally in all directions
  – Buffer distance varies with fumigation method, acres, application rate, and buffer credits; 25 ft minimum

• **Maximum application rate and acreage:**
  – 225 to 350 lbs/ac, depending on fumigation method
  – 120 to 160 acres (application block), depending on fumigation method

• **Buffer zone duration:** buffer in effect until 48 hrs from end of fumigation
EPA mitigation: label requirements for buffer zones and related restrictions

- **Buffer zone proximity**: overlapping buffers prohibited unless 12 hrs elapses between fumigations
- **Buffer zone posting**: required along buffer perimeter at usual points of entry to field
- **Restrictions for difficult to evacuate sites**:
  - Pre-K to grade-12 schools, state licensed daycare centers, nursing homes, assisted living facilities, hospitals, in-patient clinics, prisons
  - Depending on buffer distance, no occupied difficult to evacuate sites within 1/4 or 1/8 mile of fumigation for 36 hrs after end of fumigation
- **Emergency preparedness and response measures**: if triggered, response information for neighbors or fumigant monitoring required
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Buffer zone development: air monitoring and computer modeling

- DPR developed buffer zones using air monitoring data and computer modeling
- DPR simulated several thousand fumigations to estimate distance to 73 ppb target concentration
- Data used and modeling procedures described in DPR technical memo
Buffer zone development: buffer zone description and percentile of protection

- **Buffer zone**
  - Only fumigation handling activities and transit allowed (labels)
  - Distance from the fumigated area to the 73 ppb target concentration in downwind direction
  - Several thousand computer simulations show buffer distance ranges from 0 to 4700+ feet

- **Percentile of protection** represents the frequency or probability of not exceeding the 73 ppb target concentration outside buffer zone
  - Buffer zone distances calculated for 80th, 85th, 90th, and 95th percentile of protection
  - DPR will select percentile after considering public comments
  - DPR cannot be less restrictive than EPA-approved label
Buffer zone development: buffer zone description and percentile of protection

Chloropicrin downwind concentration <73 ppb outside the buffer zone for 80% of the fumigations, or 85% of the fumigations, or 90% of the fumigations, or 95% of the fumigations
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Buffer zone distances: buffer tables

- 3 buffer tables, one for each tarp type
  - TIF (totally impermeable film)
  - Non-TIF (other tarp types)
  - Untarped

- Each table shows buffer distances that vary with
  - Application rates (broadcast-equivalent)
  - Acres

- Label buffers differ from DPR buffers due to differences in computer modeling inputs
Buffer zone distances: example label versus DPR buffer for non-TIF applications

- Field area (application block): 40 acres
- Application rate for fumigated area: 150 lbs/ac
- Bed/strip area: 67% of field area

<table>
<thead>
<tr>
<th>Application Method</th>
<th>Application Rate (lbs/ac)*</th>
<th>Label Buffer (ft)</th>
<th>DPR 80% Buffer (ft)</th>
<th>DPR 95% Buffer (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadcast</td>
<td>150</td>
<td>179</td>
<td>93</td>
<td>941</td>
</tr>
<tr>
<td>Bed</td>
<td>100</td>
<td>25</td>
<td>16 (60-100)**</td>
<td>412</td>
</tr>
<tr>
<td>Strip</td>
<td>100</td>
<td>136</td>
<td>16 (60-100)**</td>
<td>412</td>
</tr>
<tr>
<td>Drip</td>
<td>100</td>
<td>40</td>
<td>16 (60-100)**</td>
<td>412</td>
</tr>
</tbody>
</table>

* Broadcast-equivalent application rate
** Buffer will default to DPR minimum distance, 60-100 ft
Buffer zone distances: example label versus DPR buffer

Label buffer: 179 ft

DPR 80% buffer: 93 ft

FUMIGATED AREA
40 acres (920 x 1900 ft)
150 lbs/ac
Non-TIF tarp
Broadcast application method

DPR 95% buffer: 941 ft
Buffer zone distances: minimum buffer

- DPR and EPA modeling shows concentrations <73 ppb at field edge in some cases, but based on certain assumptions
  - Square field
  - Consistent emissions across field

- Label minimum buffer 25 ft

- DPR proposal
  - Minimum buffer 60-100 ft for untarped and non-TIF
  - Minimum buffer 25 ft for TIF
Buffer zone distances: label versus DPR buffers

- Most DPR 80% modeled buffers are smaller than label buffers
  - Label buffer zones would be required in these cases

- Most DPR 95% modeled buffers are larger than label buffers

- Except for minimum buffers, label buffers are larger than all DPR modeled buffers for
  - Untarped drip applications
  - TIF applications
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Emergency preparedness and response: triggers

• Labels: measures not required if buffer zone is 25 feet

• Labels: certified applicator must provide response information for neighbors OR conduct monitoring if:

<table>
<thead>
<tr>
<th>Buffer zone is:</th>
<th>AND there are residences or businesses within:</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;25 ft but ≤100 ft</td>
<td>50 ft from edge of buffer zone</td>
</tr>
<tr>
<td>&gt;100 ft but ≤200 ft</td>
<td>100 ft from edge of buffer zone</td>
</tr>
<tr>
<td>&gt;200 ft but ≤300 ft</td>
<td>200 ft from edge of buffer zone</td>
</tr>
<tr>
<td>&gt;300 ft</td>
<td>300 ft from edge of buffer zone</td>
</tr>
</tbody>
</table>
Emergency preparedness and response: response information for neighbors

• For this option, labels require certified applicator to provide
  – Location of fumigation (application block)
  – Fumigant product applied
  – Contact information for certified applicator and property owner
  – Time period application is planned (1-4 weeks prior to application)
  – Early signs and symptoms, what to do if exposed
  – How to find additional information about fumigants
  – Persons must be notified again if application doesn’t occur during specified time period
Emergency preparedness and response: fumigant monitoring

- For this option, labels require certified applicator or handler to
  - Monitor for sensory irritation between edge of buffer and residences/businesses
  - Monitor at least 8 times while buffer in effect (48 hrs), including
    - 1 hr before sunset
    - During the night
    - 1 hr before sunrise
    - During daylight hours
  - Implement emergency response plan if sensory irritation occurs
Emergency preparedness and response: notification OR monitoring

DPR proposal

Label

notification in English

emergency preparedness & response trigger

monitoring area

fumigation

buffer

monitoring site

notification in English & Spanish

buffer

fumigation
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Notice of intent (NOI) submitted to agricultural commissioner

- No label requirements

- Current California regulations require
  - Field location, acres, application rate, application date, etc
  - NOI submitted at least 24 hrs prior to application

- DPR proposes additional requirements
  - NOI submitted at least 48 hrs prior to application, and specify start time
  - Application starts within 12 hrs of specified time, or resubmit NOI
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Maximum acreage and field separation

• DPR proposes 40-acre limit for application block (labels 120-160 ac)
  – Potential of illnesses with larger fumigations

• Field (block) separation based on overlapping buffers
  – Labels: overlapping buffers prohibited for 12 hours
  – DPR proposes additional restrictions based on size of area treated and proximity of other treated application blocks
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Buffer duration and tarp cutting interval

- Buffer expires 48 hours after application (labels and DPR proposal)
- DPR proposes to increase minimum TIF tarp cutting interval revised from 5 days (labels) to 9 days from end of application
## Summary comparison of requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Labels</th>
<th>DPR Proposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buffer distance (if 40 ac max)</td>
<td>TIF: max 270 ft</td>
<td>TIF: 25 ft (all min distance)</td>
</tr>
<tr>
<td></td>
<td>Non-TIF: max 674 ft</td>
<td>Non-TIF: max 893-2842 ft (80-95%)</td>
</tr>
<tr>
<td></td>
<td>Untarped: max 1990 ft</td>
<td>Untarped: max 2084-3922 ft (80-95%)</td>
</tr>
<tr>
<td>Min buffer distance</td>
<td>25 ft</td>
<td>TIF: 25 ft; Non-TIF/Untarp: 60–100 ft</td>
</tr>
<tr>
<td>Emerg prepare &amp; response</td>
<td>Notify: English</td>
<td>Notify: English &amp; Spanish</td>
</tr>
<tr>
<td></td>
<td>Monitoring: 1 location</td>
<td>Monitoring: 2+ locations</td>
</tr>
<tr>
<td>Notice of intent</td>
<td>None</td>
<td>48 hrs</td>
</tr>
<tr>
<td>Max acres</td>
<td>120–160 acre block</td>
<td>40 acre block</td>
</tr>
<tr>
<td>Buffer duration</td>
<td>48 hrs</td>
<td>48 hrs</td>
</tr>
<tr>
<td>TIF tarp cutting</td>
<td>5 days</td>
<td>9 days</td>
</tr>
</tbody>
</table>

- DPR also proposes additional restrictions for
  - Buffer zone credits
  - Overlapping buffer zones
  - Tree hole fumigations
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Concluding remarks: next steps

- Mitigation proposal presentations
  - Agricultural commissioners
  - Registrants
  - Growers and applicators – regional meetings
  - Environmental and worker advocates, workers, public – regional meetings

- Send technical memo for scientific peer review

- Make any changes to mitigation measures after comment period

- Implement mitigation measures

- Agricultural commissioners consider additional restrictions through permit conditions
Concluding remarks: additional information and submitting comments

- The mitigation proposal and other documents are available on DPR’s website:
  - www.cdpr.ca.gov
  - “LATEST NEWS AND INFORMATION”

- Submit written comments by July 31 to:
  - Linda O’Connell
  - Department of Pesticide Regulation
  - Worker Health and Safety Branch
  - PO Box 4015
  - Sacramento, CA 95812-4015
  - loconnell@cdpr.ca.gov