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
- Mitigation Concepts Under Consideration
- What's Next

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).

Background

CDPR

- 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

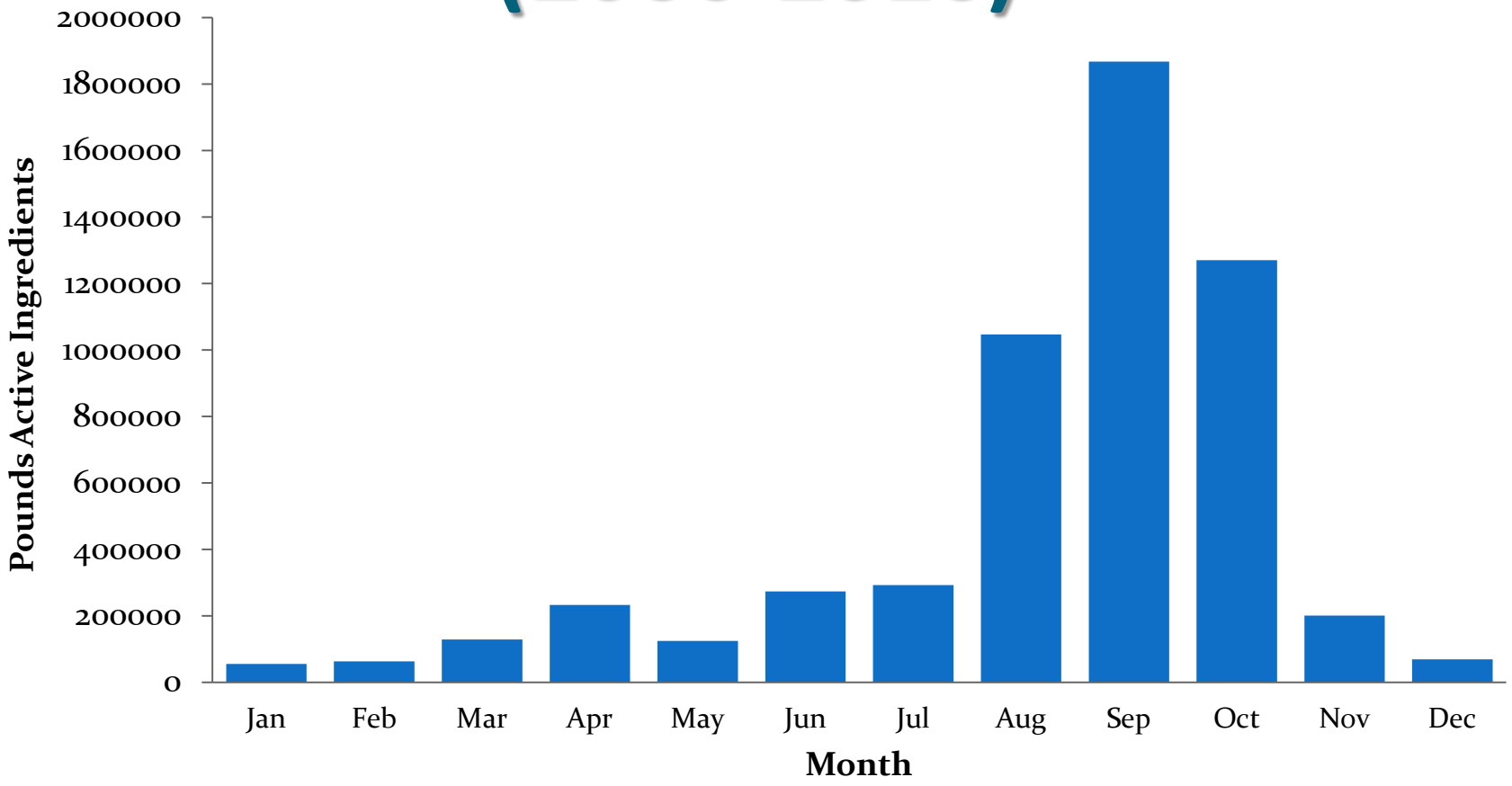
CDPR

- 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

COUNTY	AVERAGE POUNDS OF CHLOROPICRIN	PERCENT AVERAGE TOTAL ANNUAL USE
Monterey	1,143,877	20.3
Ventura	1,157,825	20.6
Santa Barbara	507,594	9.0
Santa Cruz	418,513	7.4
Siskiyou	246,746	4.4
TOTAL	3,474,554	**~62%**

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

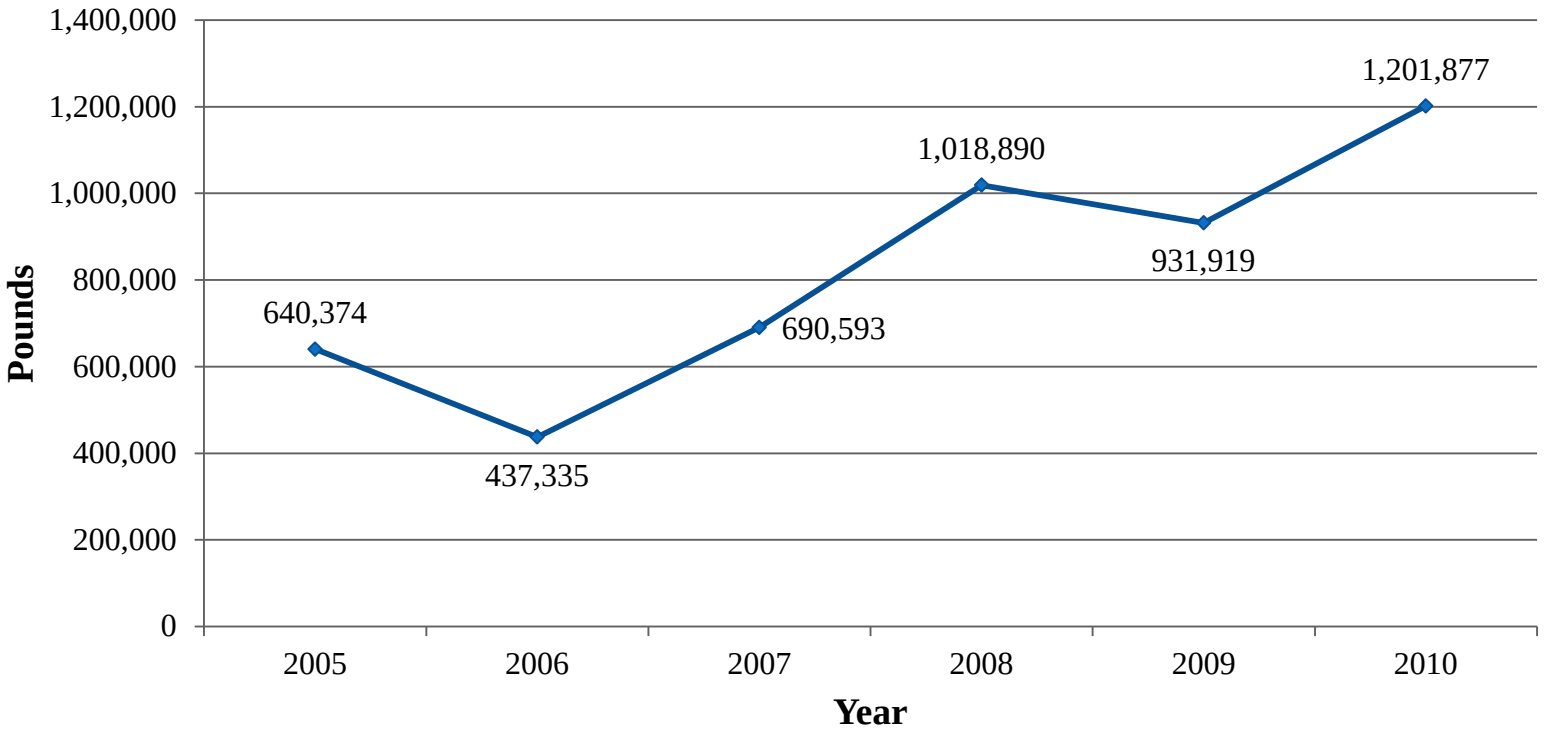
- Daughter plants are harvested, bundled, refrigerated and shipped for field planting and fruit production.
- Harvesting operation occurs in September – October, depending on when planting occurred.
- Siskiyou harvesting schedule is a driving force on when strawberry growers need to have fumigations completed and ground ready to be planted.

Increasing Use of Chloropicrin

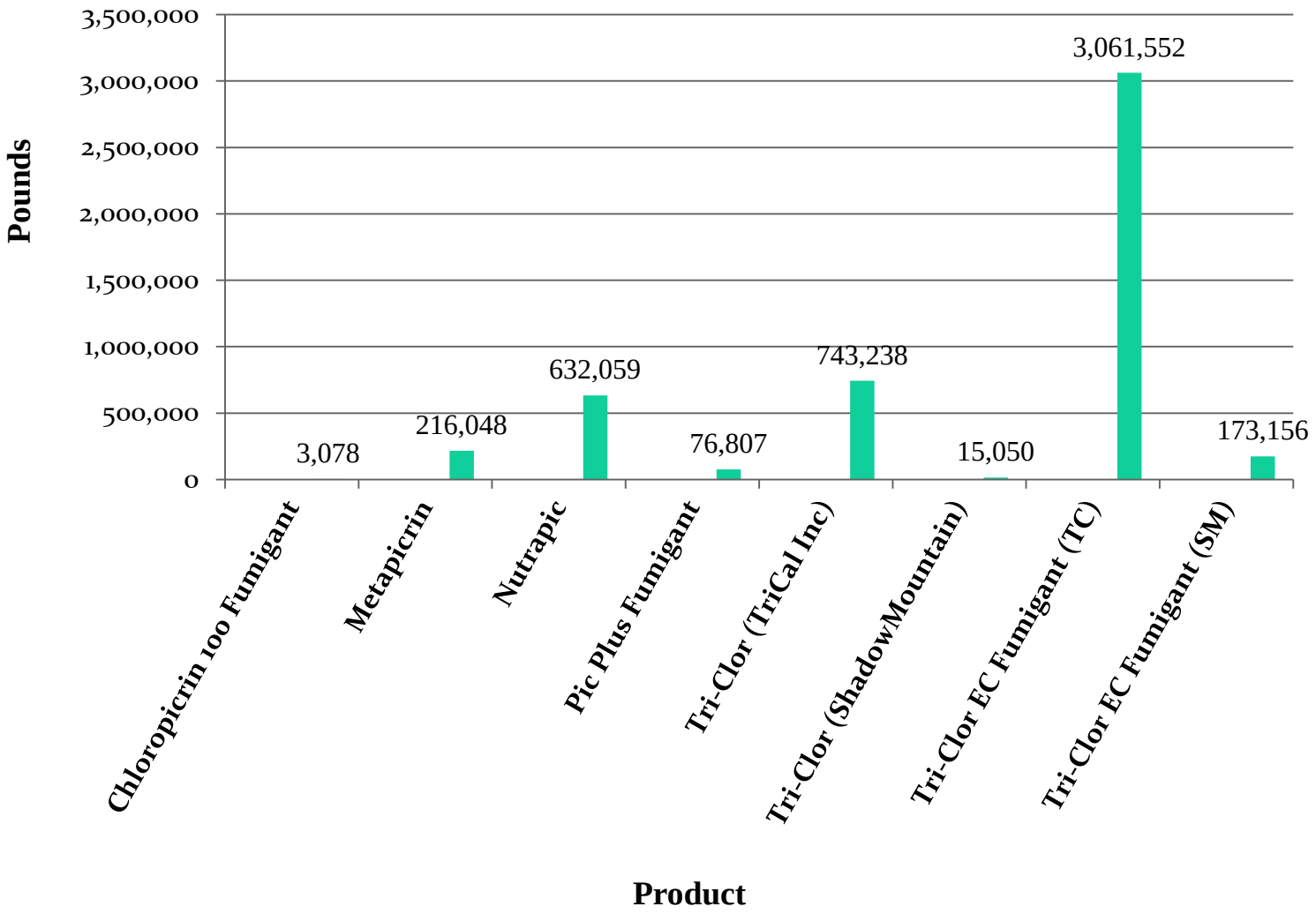
- There has been an increased use of chloropicrin over the years due to unavailability of methyl bromide and 1,3-D.
  - Applications made with formulations containing less methyl bromide and more chloropicrin.
  - Applications made with 100% chloropicrin when 1,3-D cap exceeded, or when methyl bromide is unavailable.

Increasing Use of 100% Chloropicrin

Total Pounds 6 Year Period: 4,920,988



Increased use of Chloropicrin



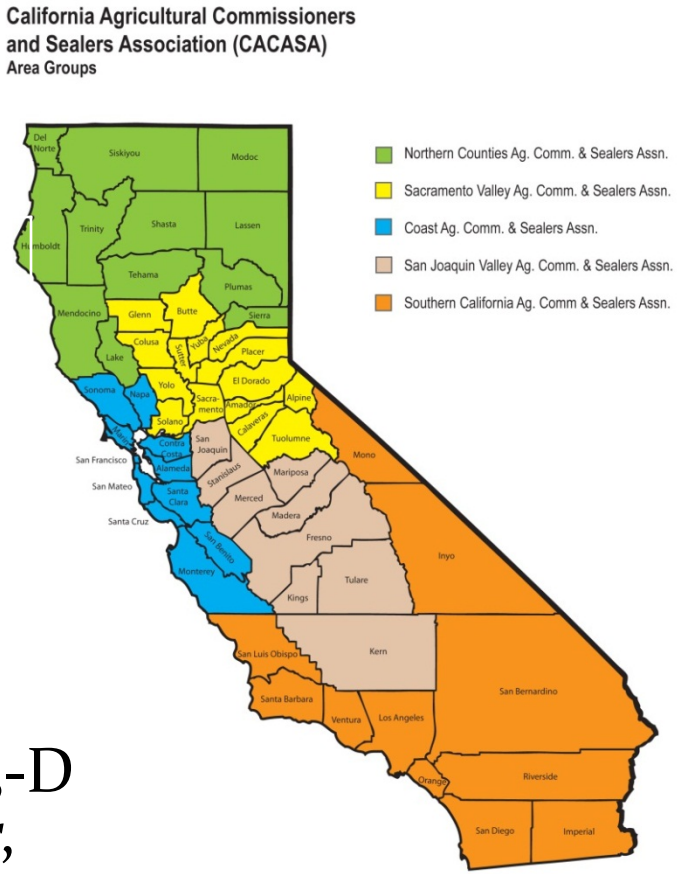
Discussions with CAC Staff

- Talked with CAC staff from various counties to learn of any issues they were facing with chloropicrin applications:

Merced	Del Norte
Santa Cruz	Modoc
Tehama	Lassen
Shasta	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.