California Environmental Protection Agency
Department of Pesticide Regulation

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, credits
  - Emergency preparedness and response
  - Notice of intent
  - Maximum acreage and field separation
  - Buffer zone duration and tarp cutting interval
  - Tree hole restrictions
  - Combination products
- Concluding remarks

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: 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

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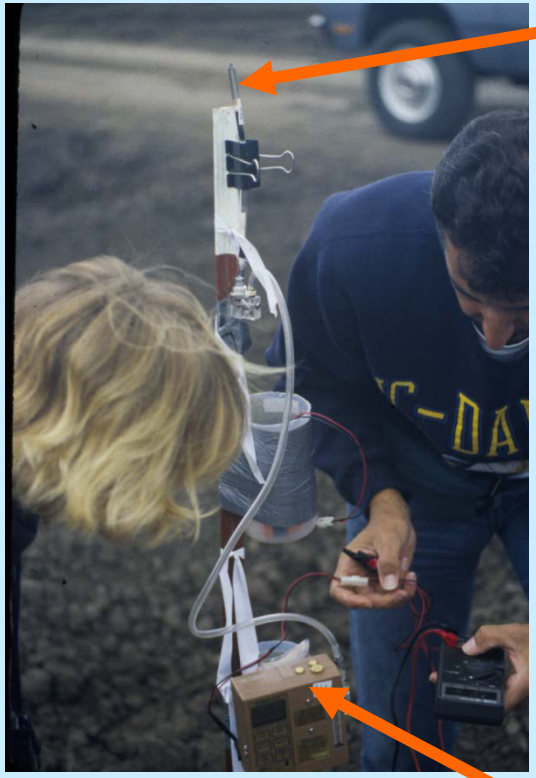
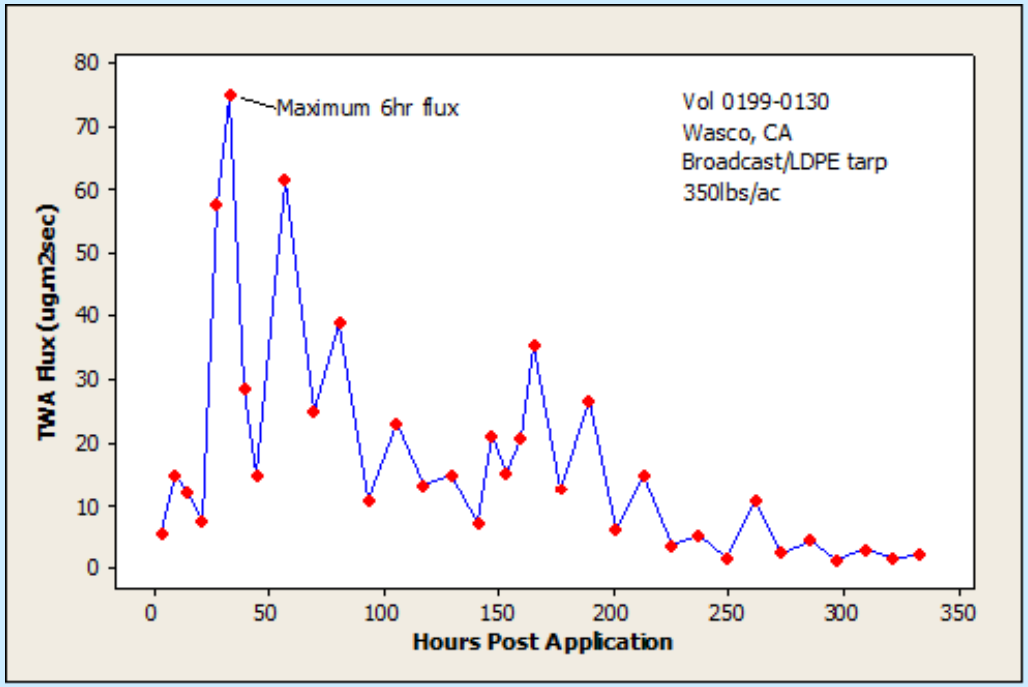
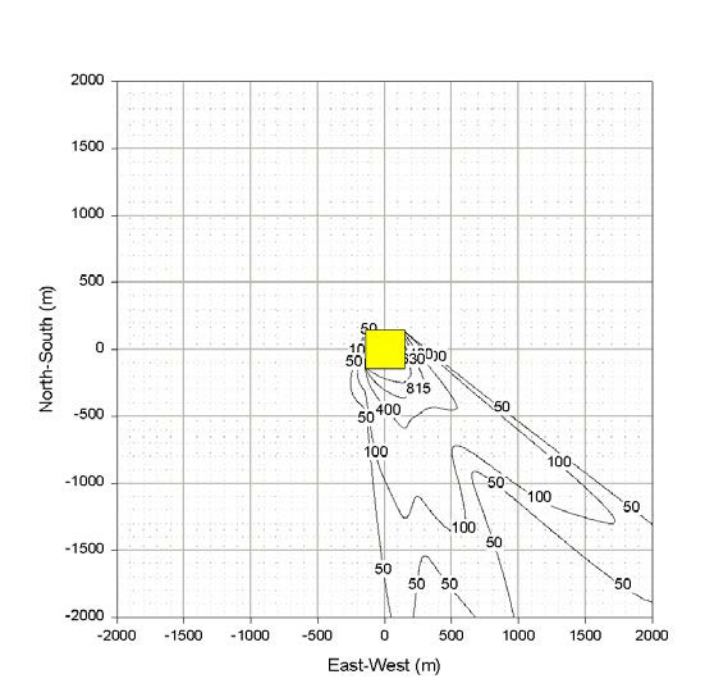
Buffer zone development: air monitoring to estimate emissions





Buffer zone development: computer modeling

- DPR supplements air monitoring data with computer modeling to estimate air concentrations and develop buffer zones
- Key model inputs are emissions and weather data
- Model output: air concentrations around field
- 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 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

BUFFER ZONE
(fumigation activities and transit)

fumigation

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Buffer zone distances: buffer tables

- 3 buffer tables, one for each tarp type
  - TIF (totally impermeable film, tarp assigned 60% buffer credit)
  - Non-TIF (standard polyethylene, 20% buffer credit, 40% buffer credit)
  - 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 buffers for untarped applications

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

Application Method	Application Rate (lbs/ac)*	Label Buffer (ft)	DPR 80% Buffer (ft)	DPR 95% Buffer (ft)
Broadcast	150	1038	597	1402
Bed	100	350	228	755
Deep (broadcast)	150	760	597	1402
Drip	100	997	228	755

* Broadcast-equivalent application rate

Buffer zone distances: example label versus DPR buffers 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

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

* Broadcast-equivalent application rate

** Buffer will default to DPR minimum distance, 60-100 ft

Buffer zone distances: example label versus DPR buffers for TIF applications

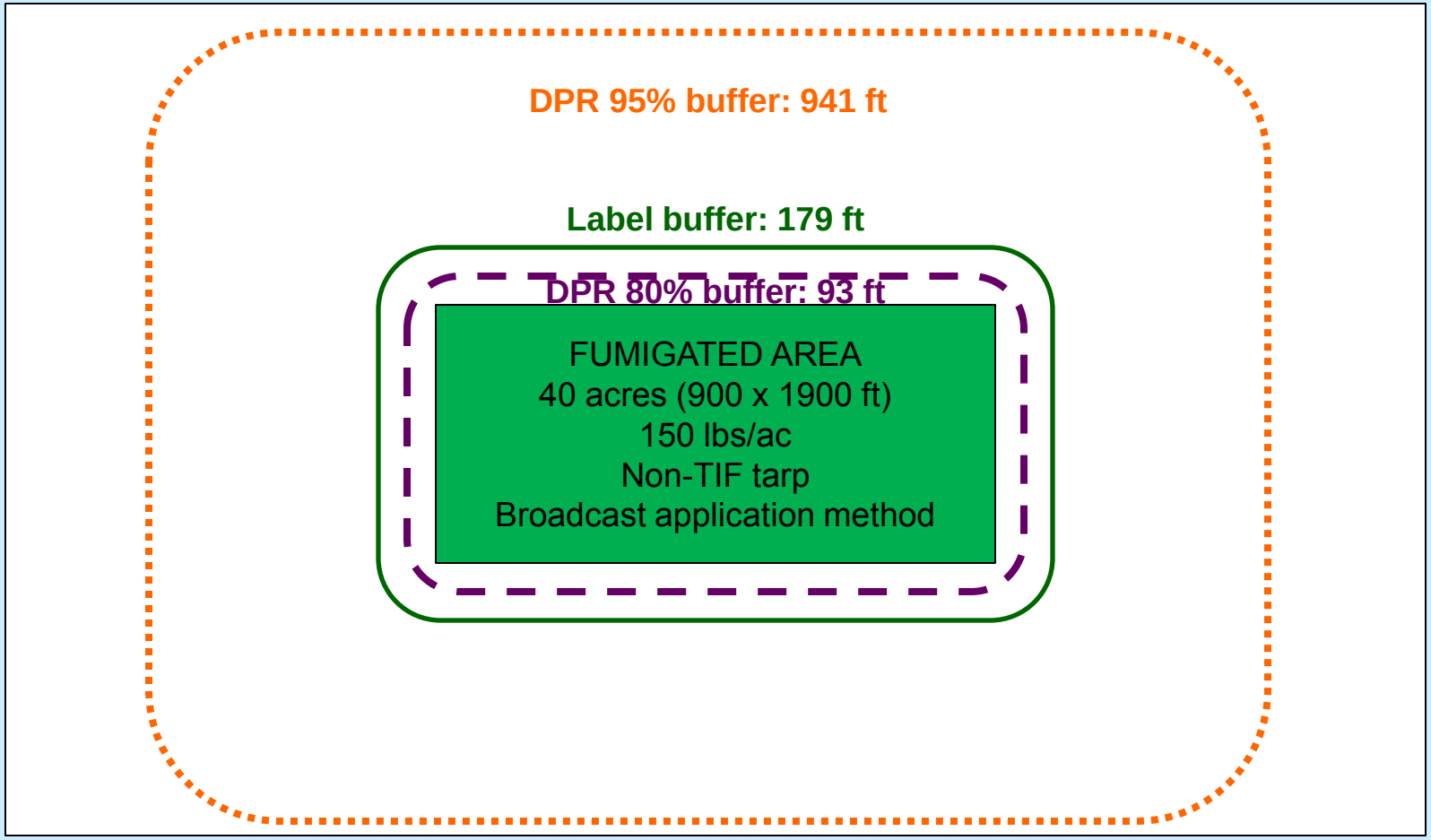
- Field area (application block): 40 acres
- Application rate for fumigated area: 150 lbs/ac
- Bed/strip area: 67% of field area

Application Method	Application Rate (lbs/ac)*	Label Buffer (ft)	DPR 80% Buffer (ft)	DPR 95% Buffer (ft)
Broadcast	150	25	0 (25)**	0 (25)**
Bed	100	25	0 (25)**	0 (25)**
Strip	100	54	0 (25)**	0 (25)**
Drip	100	25	0 (25)**	0 (25)**

* Broadcast-equivalent application rate

** Buffer will default to DPR minimum distance, 25 ft

Buffer zone distances: example label versus DPR buffer



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: reduction credits

- Labels reduce buffer distances using “credits” for conditions and practices with lower emissions
- EPA assigns 60% buffer credit for TIF
- DPR evaluation shows ~80% reduction for TIF
- Additional DPR evaluation of credits in progress

Condition	% Reduction
Low perm tarp	20-60
Soil OC 1-3%	10-30
Clay >27%	10
Soil temp <50° F	10
Symmetry	10
Thiosulfate	15
Water seal	15

Buffer zone distances: label versus DPR modeled buffers

- Most DPR 80% modeled buffers are smaller than label buffers
  - Label buffers 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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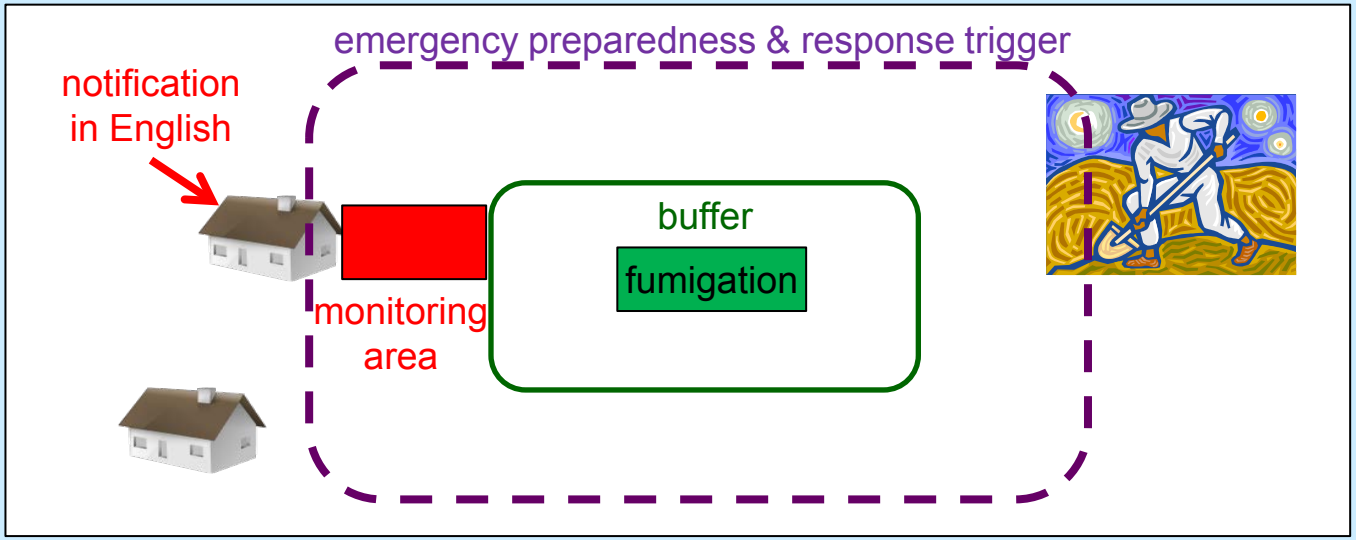
Emergency preparedness and response: triggers

- Labels: measures not required if buffer zone is 25 feet or less
- Labels: certified applicator must provide response information for neighbors OR conduct monitoring if:

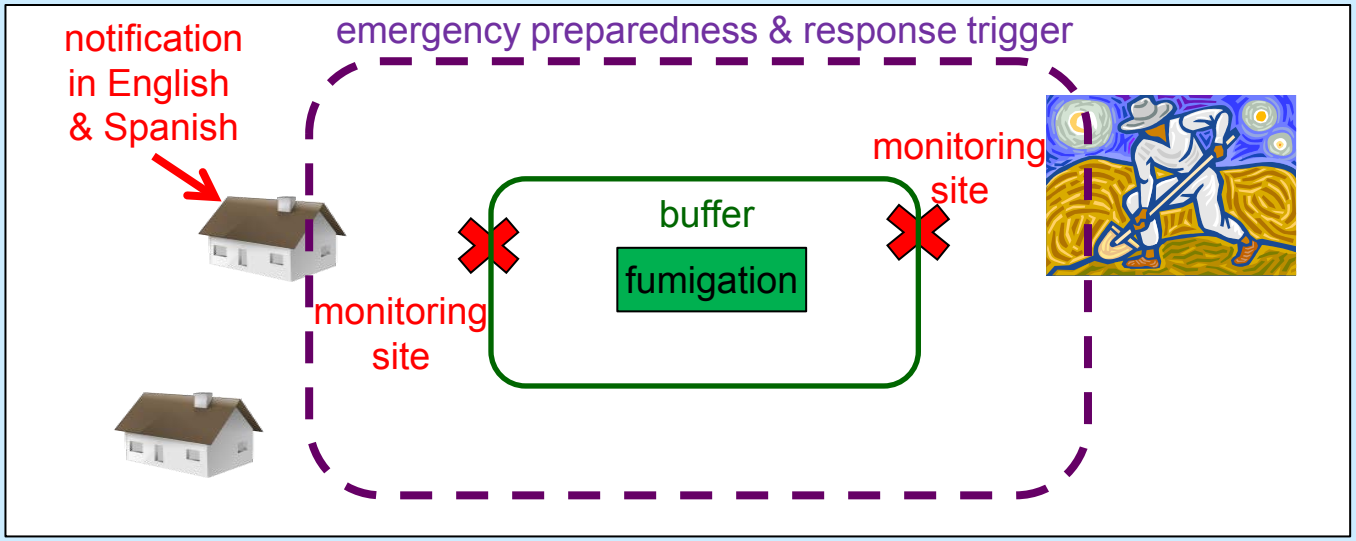
Buffer zone is:	**AND there are residences or businesses within:**
>25 ft but ≤100 ft	50 ft from edge of buffer zone
>100 ft but ≤200 ft	100 ft from edge of buffer zone
>200 ft but ≤300 ft	200 ft from edge of buffer zone
>300 ft	300 ft from edge of buffer zone

Emergency preparedness and response: notification OR monitoring

Label



DPR proposal



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Notice of intent (NOI) submitted to agricultural commissioner

- No label requirements
- Current 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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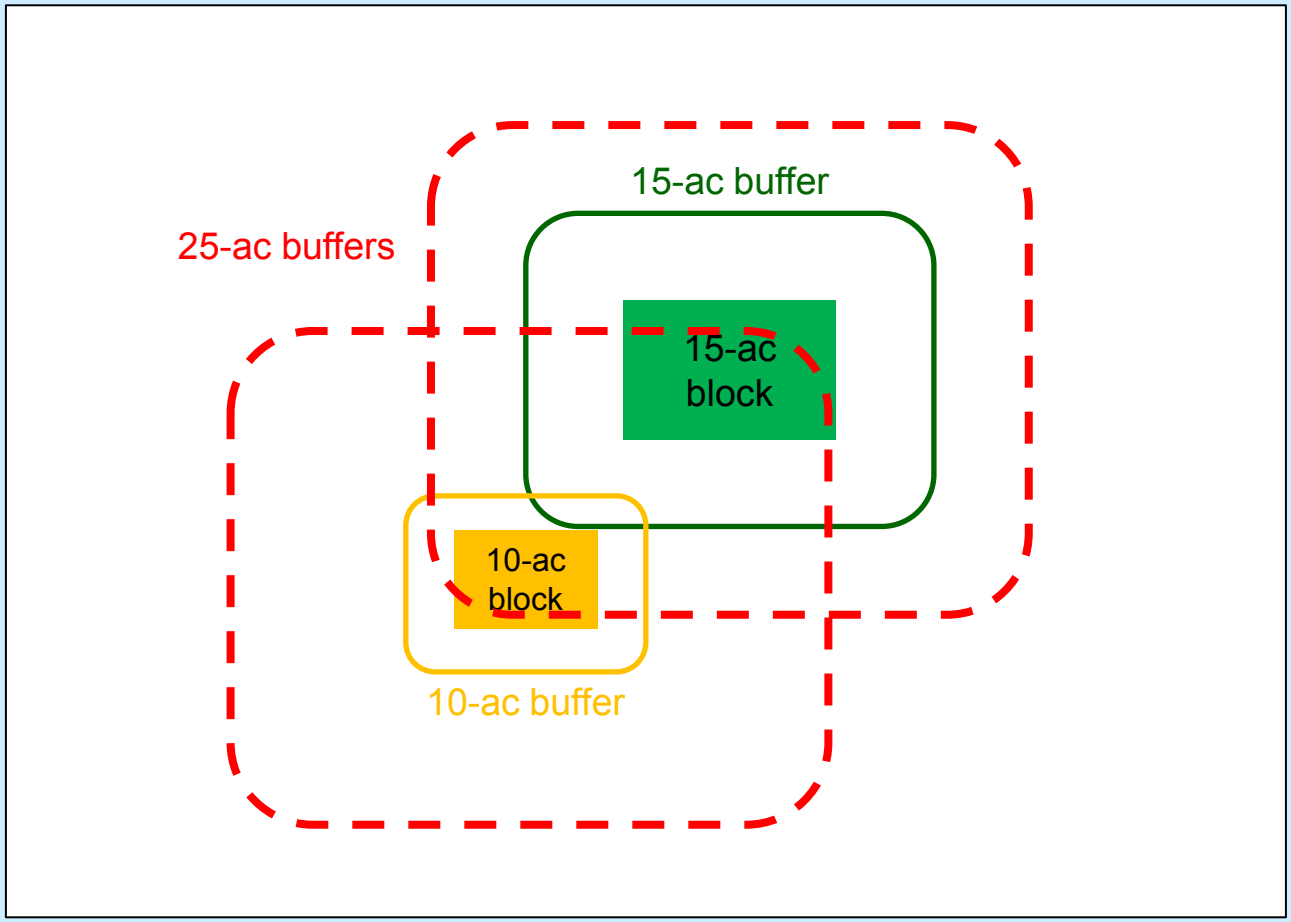
Maximum acreage and field separation

- 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 proposal for overlapping buffers:
    - Acreage combined to determine buffer if overlap for 12-36 hrs
    - Combined acreage can’t exceed 40 acres
    - Exception: buffers for TIF applications are not based on combined acreage in cases where the overlap

Maximum acreage and field separation: overlapping buffers example



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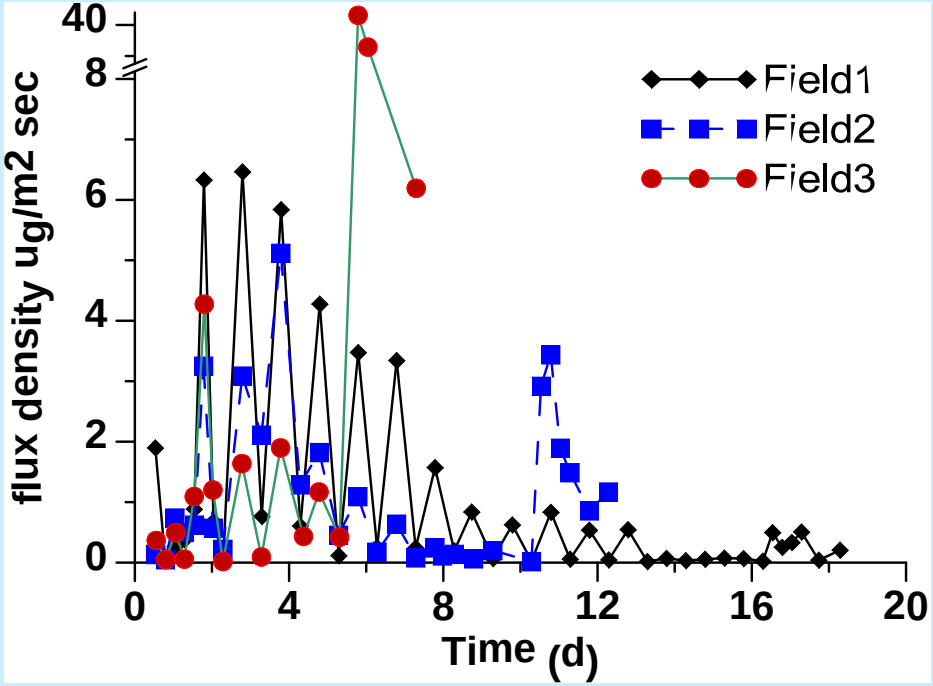
Buffer duration and tarp cutting interval

- 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



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Tree hole restrictions

- Labels
  - Buffer zone 25 ft
  - Maximum application rate = 1 lb/hole, 435 lbs/ac
- DPR proposal
  - Maximum number of tree holes per day based on untarped buffer zones

Percentile	Estimated Max Tree Holes
80th	230
85th	220
90th	190
95th	160

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Combination products

- Buffers for 1,3-D/chloropicrin products will be based on chloropicrin
- Requirements for methyl bromide/chloropicrin products will depend on the relative mixture and reconciling with current methyl bromide regulations
  - Depending on fumigation method and percentile, chloropicrin will drive buffer distances when present at 20-43%, except TIF
  - More stringent minimum methyl bromide buffers will not change, regardless of mixture
  - TIF allowed with methyl bromide, no buffer distance reduction

Summary comparison of requirements

Requirement	Labels	DPR Proposal
Buffer distance (if 40 ac max)	TIF: max 270 ft Non-TIF: max 674 ft Untarped: max 1990 ft	TIF: 25 ft (all min distance) Non-TIF: max 893-2842 ft (80-95%) Untarped: max 2084-3922 ft (80-95%)
Min buffer distance	25 ft	TIF: 25 ft; Non-TIF/Untarp: 60–100 ft
Buffer credits	Several	None, but separate TIF table
Emerg prepare & response	Notify: English Monitoring: 1 location	Notify: English & Spanish Monitoring: 2+ locations
Notice of intent	None	48 hrs
Max acres	120–160 acre block	40 acre block
Field separation	Prohibit overlapping buffers for 12 hrs	Buffer based on combined acres if overlapping buffers during 12–36 hrs
Buffer duration	48 hrs	48 hrs
TIF tarp cutting	5 days	9 days
Tree hole limit	None	160–230 holes per day

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Concluding remarks: next steps

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

- 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