Structural Fumigation: California Aeration Plan "CAP"

DPR-SPCB Structural Regulatory Training

Pomona, CA

June 14, 2012

Peggy Byerly

Department of Pesticide Regulation

CAP Presentation Overview

Per ENF 2010-20: CAP is the only aeration method approved in California under 3CCR 6780(c)

Key Points Covered Today Include:

- CAP vs. SF Labeling
- CAP equipment & setup (Ducting, Inlets)
- CAP Table 1 (# D & I) & Table 2 (Hours)
- CAP's 4 Steps = Required Procedures

CAP Overview - SCBA Caveat

Although the California Aeration Plan is designed **not** to have an employee enter during a time of unknown atmosphere, so no SCBA is normally required during aeration, if ANY equipment malfunction or other fumigation emergency occurs prior to completing CAP Steps 1-2…

SCBA must be used to enter per SF labels, 3CCR 6739, 6780(b) & 16 CCR 1971 (see also CAP page 3).

CAP vs. SF Labeling Procedures

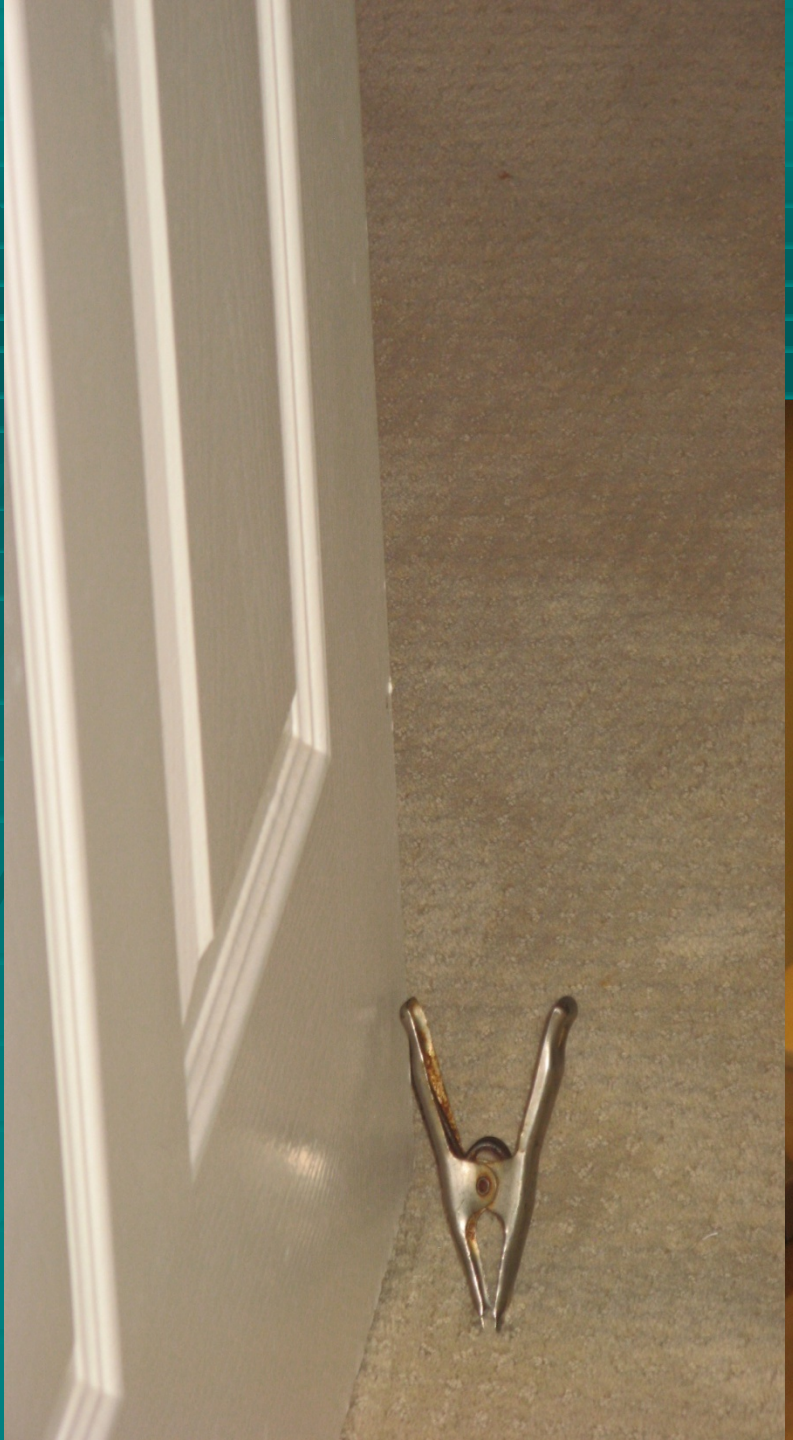
CAP supercedes the registered SF labeling for the "Aeration Procedure Steps 1 & 2" when CAP is used, but CAP doesn't change label-required "interior prep" activities (see CAP pg.1) such as food bagging and opening all operable internal doors including:

- ☑ **Attics & subareas**
- ☑ **Storage chests/cabinets/drawers/closets**
- ☑ **Appliances (such as oven, washer/dryer)**

CAP Interior Preparation

Direct a fan into each attic

Secure inside doorways; prevent doors slamming shut during aeration



CAP Interior Preparation

CAP Page 1

"Internal Openings"

If structure has an <u>attached garage</u>, open the door between the garage and the structure

Misc. Industry Considerations

- Force of Aerating:
  - Tears in tarps
  - Doors slamming shut;
  - ↓ air movement

- Security Issues:
  - 3” openings
  - Non-standard situations

- Other Issues:
  - Tarp life/#’s of tarps, clips, fans
  - Onsite security construction

CAP Overview – Equipment

<u>CAP-specific equipment (see page 2)</u>:

1. Installed during application phase setup
2. Durable Reinforced Ducting (can be DIY)
3. Aeration-specific fans, each ≥ 18 in. width

CAP Overview – Equipment

CAP-specific equipment:

Also installed during application phase setup

- **Inlet Devices** (manufactured or DIY)
- **Remote activation** (outside structure & tarp) for fans in CAP Step 1.

“Remote” Setup Examples

Switch box

“Low Tech”
Inconspicuous Option

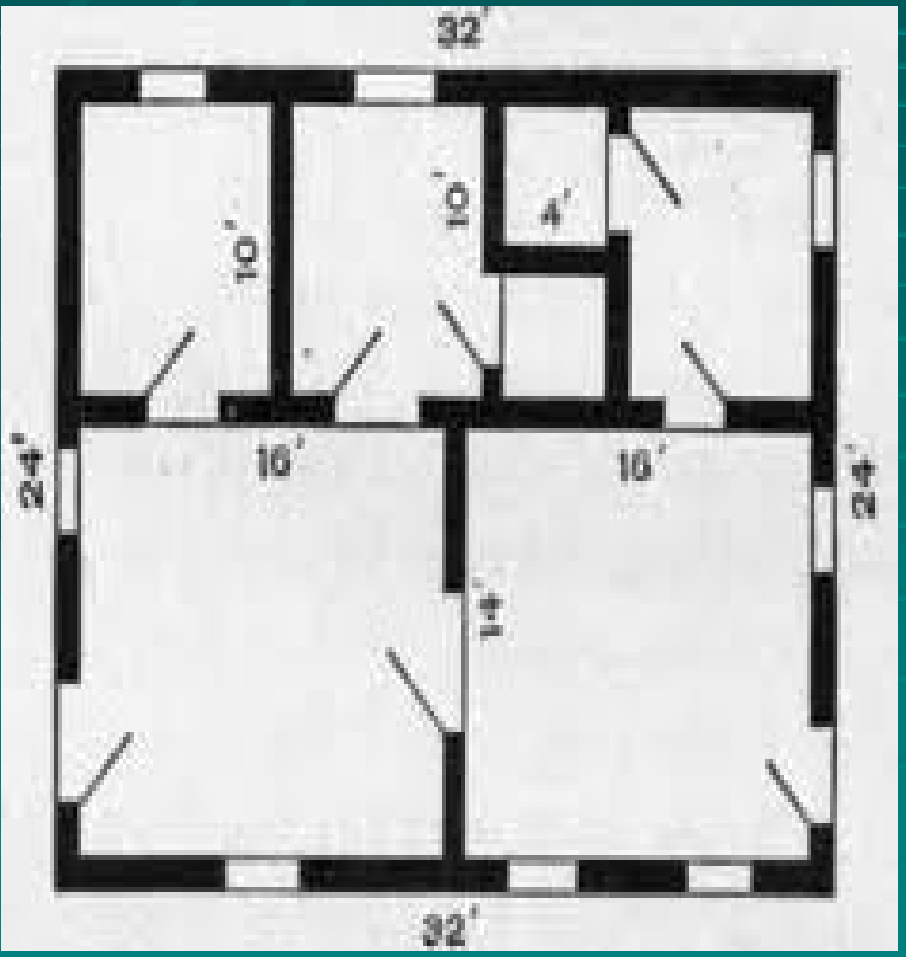
1 Type Of Fan – Used 3 Ways

“Shooting” Fans – with pic pan

1 Type Of Fan – Used 3 Ways

“Air Circulation” Fans

“Air Circulation” Fans



<u>Heavy storage load</u>

Fan(s) to aid pic aeration

<u>Non-standard situations</u>
(like no operable windows)

Enough fans to aerate entire fumigated space

1 Type Of Fan – Used 3 Ways

CAP-Specific Use: "Ducted Air Fans" (DAF)

Reinforced Ducting Options

Manufactured Examples

CAP Ducting Exterior “Seal”

Exterior end of ducting must have a **seal** (“flap” or cap) to keep SF from escaping until it is opened/removed in CAP Step 1.

CAP Ducting Exterior “Seal”

“Seal the aeration duct in a manner that it can be opened remotely from ground level...”

CAP Aeration Eqpt Placement

"Aeration equipment (DAF, Inlets) installed <u>prior</u> to fumigation..."

CAP Aeration Fan(s) Placement

Install Ducted Aeration Fans placed to draw the air through the structure/space

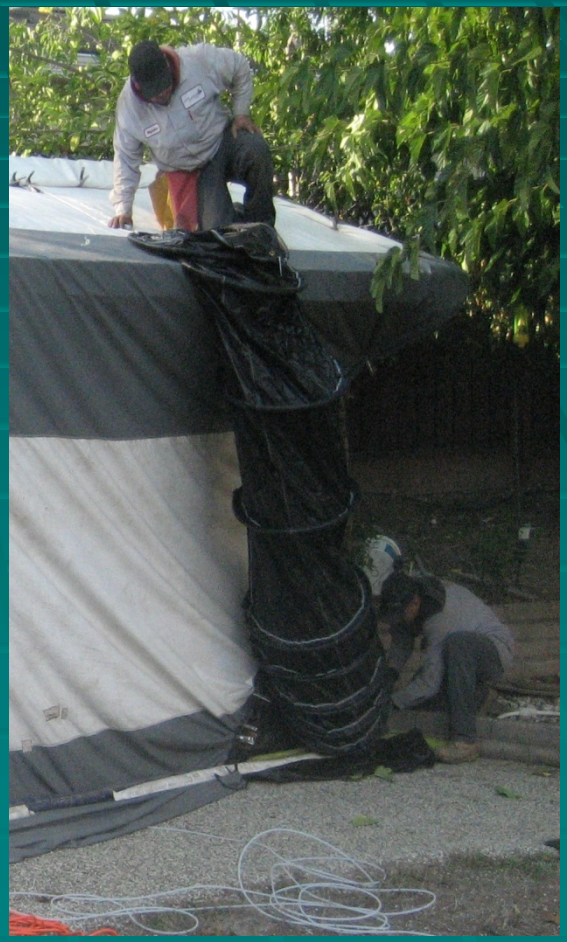
CAP Aeration Fan(s) Placement

Ducting must extend through tarps and discharge vertically outside the tarp.

CAP – Ext. Ducting Placement

Single Story Ducting

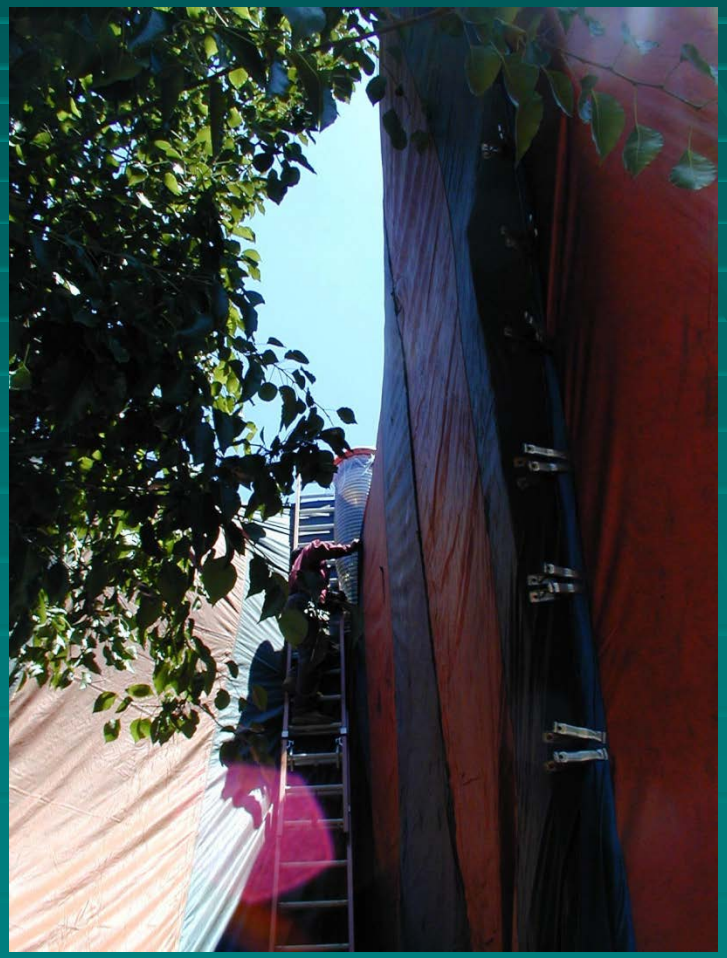
Must extend from fan end (inside) to roofline, <u>or</u> at least 10 feet above ground for <u>higher</u> rooflines



CAP – Ext. Ducting Placement

Multi Story – D.A.F.

Photos show 2nd story attachment



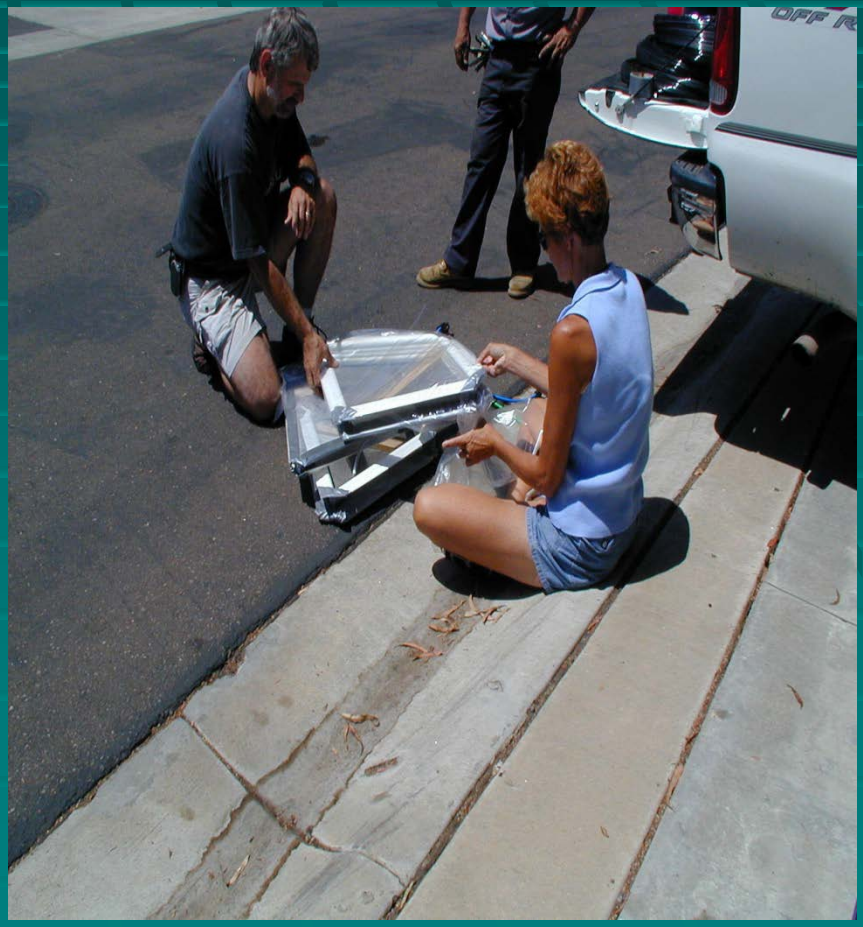
CAP Inlet Device Requirements

- Inlet Opening size 254 sq inches each if only minimum # inlets used per Table 1.
- Inlet Opening – such as mesh, net, or wire to allow ventilation air flow
- Inlet Opening Cover (application phase) of "highly resistant material"
- # Inlets per structure depends on total # cubic feet calculated volume (Table 1)

CAP Inlet Device Requirements

Photo = “DIY option” used during the 2004-5 DOW aeration study

When using smaller than 254 sq inch size inlets, more inlets will be needed* to achieve total required surface area! (*CAP page 4 footnote)



CAP Inlet Device Requirements

Inlet device <u>shape</u> is optional, as long as it can be covered in a manner to allow remote opening from outside during Step 1

CAP Inlet Device Requirements

Inlet Device Placement

- Placed ≥ **4** feet above exterior grade
- Should be placed opposite from where discharge (aeration ducting) is located
- Where inlet opening air flow is not blocked

CAP – Inlet Device Insertion

CAP Table 1: # DAFs vs # Inlets

Once the structure's **size in cubic feet** has been determined, **review CAP Table 1** for the **minimum** number of ducted air fans and inlet devices that will be needed.

Example: For structures ≤ 60,000 cu ft

1 Ducted Aeration Fan and

2 Inlet Devices are required

CAP Table 1 Exercises

Exercise #1

Residential Structure
50,000 cubic feet

How many inlets would the B1 need to install if their inlets had mesh openings **12 X 12 inches?**

OR…How many if **ROUND** inlets, each **18 inches** in diameter?

Exercise #2

Commercial Structure
350,000 cubic feet

How many inlets would the B1 need to install if their inlets had mesh openings **16 X 16 inches?**

How many Ducted Aeration Fans must be used?

CAP Table 2: Aeration Hours

Once the structure's cubic feet is measured and the sulfuryl fluoride label calculations for concentration of fumigant are known, consult CAP Table 2 to determine minimum number of hours aeration time.

Example: For **≤ 16 ounces SF** per 1K cu ft

Minimum Aeration Time = **12 hours**

CAP Table 2 Exercises

For these exercises assume the Drywood Termite SF "1X" rate for the structure would be calculated at 16 oz / 1000 cubic feet.

Exercise #1
BEDBUG Fumigation

The SF label states the Kill Power Index for Bedbugs is 3X.

What is the minimum CAP aeration time for this fumigation?

Exercise #2
RODENT Fumigation

The SF label states the Kill Power Index for Rodents is 0.5X.

What is the minimum CAP aeration time for this fumigation?

CAP Aeration - Timing Concerns

- Aeration time based upon initial SF concentration/Table 2
- Aeration can't begin between 12am & 30 minutes b'4 Sunrise
- Minimum 24 hr aeration IF:
  - **"High ambient" temperature is < 40°F at fume site…**
    For the aeration period
- No workers on roof w/o SCBA
  When D.A.F.s are operating

CAP - Step 1 (Onset)

Step 1

Remove seals from the exterior duct ends

AND

Activate ducted aeration fans from outside

(“remote activation”)

CAP - Step 1 (2nd Half)

Step 1 continues…

"After ALL aeration fans (D.A.F.s) are activated…"

Remove seals (cover) from **each** of the previously installed **inlet devices**

CAP - Steps 2 & 3

Step 2

After required # hours of aeration per Table 2 are completed, **turn off the aeration fans**

Step 3

After fans turned off, remove all tarpaulins and/or seals (snakes) from the structure

CAP - Step 4 (Final To Clear)

Licensee assures:

- **Enter structure with continuous monitoring device** (Interscan/ExplorIR) and **before** certifying and posting safe for re-entry sign…
- **Remove all chloropicrin pans**
- When applicable: for central air/heating systems, turn on the system fan/blower for each unit **OR** circulation fan may be placed in front of furnace inlet to blow air into the ducts

CAP - Step 4 Clear For Re-entry

- Next measure the concentration of fumigant in breathing zones using approved fumigant detection device per the registered label. If structure tests ≤ 1.0 ppm, it's ready for certification…OR
- If concentration measures > 1.0 ppm, open operable doors & windows for additional ventilation (usually just a few minutes) until detection device confirms ≤ 1.0 ppm

What We Hope NOT To See

BLOCKED INLETS

CAUTION! If You See This…

"No Gas…No Intent"???

A few companies have sometimes used this to "decoy" inspectors

CAC may want to check this location to see if company returned the next day w/o submitting a new NOI

Additional Thoughts Regarding CAP "Non-Standard" Scenarios

When industry does not do the CAP setups in the manner specified, observe and ask more questions to help determine whether they have sufficiently addressed those issues, such as:

- Ensuring air flow throughout the structure
- Insufficient air movement in "packed" rooms that may hinder chloropicrin evacuation
- Doorway barriers to deter unauthorized entry, when no operable windows available

ANY FINAL
CAP
QUESTIONS
????????