



Methyl Bromide Field Fumigation

Application Methods and Equipment

Updated July 2014

This Presentation Takes Into Consideration:



- 2012 Federal label requirements;
- DPR regulations; and
- DPR's recommended permit conditions.

Users are required to follow whichever requirement is most restrictive (most protective)

APPLICATION METHODS



1. Hand Held Tree Hole Replant*
2. ~~Non Tarp, Shallow-Bed~~
3. Non Tarp, Deep Broadcast*
4. Tarp, Shallow-Broadcast
5. Tarp, Shallow-Bed
6. Tarp, Deep-Broadcast
7. ~~Drip System-Hot Gas~~

*Specific uses only - ~~No longer allowed~~



1. Hand Held Tree Hole Replant

Must be less than one contiguous acre



3CCR § 6447. Methyl Bromide Field Fumigation General Requirements

For purposes of these sections, field soil fumigation does not apply to golf courses, replant of individual vine or tree-sites (tree holes) less than one contiguous acre, raised-tarpaulin nursery fumigations of less than one acre, potting soil, and greenhouses and other similar structures.

Handheld Application

3CCR § 6447



- Treated area must be less than one contiguous acre
 - DPR field fumigation exemption
3CCR Section 6447
- Applications 1 acre and greater are a violation of 3CCR Section 6447.3 (a)
- Follow the requirements on the label:
 - 25 foot minimum buffer zone

Handheld Application

3CCR § 6447



- Not all methyl bromide products allow the handheld application method. Verify this is an approved application method for the product being used.
- List of Methyl Bromide products allowing handheld tree hole applications (as of 7/9/2014)
 - MBC Concentrate Soil Fumigant EPA No. 1120-32
 - Methyl Bromide 89.5 % EPA Reg. No. 11220-17
 - Methyl Bromide 98% EPA Reg. No. 8536-19
 - TERR-O-GAS 98 EPA Reg. No. 5785-22



2. Non-Tarp Shallow Bed



3CCR § 6447.3 (a)(1)

Application method no longer allowed due to federal label changes – December 2012



3. Non-Tarp Deep Broadcast*



3CCR § 6447.3(a)(2)

*2012 Federal Label Changes Restrict This Application
Method To Deep Shank Orchard Replant Only

Non-Tarp, Deep-Broadcast

3CCR § 6447.3(a)(2)



(Deep Shank Orchard Replant Only)

- Application method allowed for orchard replant only;
- Some methyl bromide labels do not allow use for orchard replant, verify it is an approved use; and
- Maximum Application Block is 40 acres.

Non-Tarp, Deep-Broadcast

3CCR § 6447.3(a)(2)



(Deep Shank Orchard Replant Only)

- **Maximum Application Rate**
 - DPR Regulation :
 - ❖ 400 pounds Active Ingredient/acre
 - Label Requirement: (varies by product)
 - ❖ measured in pounds of Product/acre
 - (convert to pounds of Active Ingredient/acre)
 - Follow the more restrictive maximum rate.

Non-Tarp, Deep-Broadcast

3CCR § 6447.3(a)(2)



(Deep Shank Orchard Replant Only)

- **Tractor Equipment**

- Forward-curved chisel
- Air fan dilution system required on the application tractor and a minimum injection depth of 20 inches

or

Closing shoes and compaction roller and minimum injection depth of 24 inches

Non-Tarp, Deep-Broadcast 2012 Federal Label Requirements



(Deep Shank Orchard Replant Only)

- Tractor Equipment Cont.
 - Injection point must be a minimum of 18 inches from the nearest soil/air interface
 - Shank spacing should be equal to application depth, but may be up to 1 ½ times the application depth
 - Shank spacing not to exceed 24 inches

Non-Tarp, Deep-Broadcast

3CCR § 6447.3(a)(2)



(Deep Shank Orchard Replant Only)

- Do not disturb soil for 4 days (96 hours) following completion of the injection
- Entry restricted period (ERP) 5 days (120 hours) after application is complete



4. Tarp Shallow Broadcast



3CCR §6447.3 (a)(3)

Tarp/Shallow/ Broadcast

3CCR §6447.3 (a)(3)



- **Maximum Application Rate**

- DPR Regulation :

- 400 pounds *Active Ingredient/acre*

- Label Requirement: (varies by product)

- measured in pounds of *Product/acre*

- (convert to pounds of *Active Ingredient/acre*)

- Follow the more restrictive maximum rate.

Tarp/Shallow/ Broadcast

3CCR §6447.3 (a)(3)



- Tractor Equipment

- Application shall be made using either:
 - Air fan dilution system on application tractor, and a plow consisting of horizontal v-shaped blades;
 - or
 - Rearward-curved (swept-back) chisels, closing shoes, and compaction roller
- Injection depth shall be between 10 to 15 inches
- Injection spacing 12 inches or less

Tarp/Shallow/ Broadcast

3CCR §6447.3 (a)(3) & Recommended Permit Condition 7.3.2



- Tarps that **Qualify** for any reduction in buffer zone distance must :
 - Not be perforated until 9 days (216 hours) have passed from the end of the application.
 - Remove tarp no sooner than 24 hours after perforated
 - Must have 2 consecutive air samples below 5ppm
 - REI:
 - Starts at injection
 - Ends after tarp removal
 - Minimum of 10 days (240 hours)

Tarp/Shallow/ Broadcast

3CCR §6447.3 (a)(3) & Recommended Permit Condition 7.3.2



- Tarps that **Do Not Qualify** for any reduction in buffer zone distance must :
 - Not be perforated until 5 days (120 hours) have passed since the end of the application.
 - Remove tarp no sooner than 24 hours after perforated
 - Must have 2 consecutive air samples below 5ppm
 - REI:
 - Starts at injection
 - Ends after tarp removal
 - Minimum of 6 days (144 hours)

Tarp/Shallow/ Broadcast

3CCR §6447.3 (a)(3) & § 6784 (b)(4)



- Tarp cutting and/or removal procedures
 - Must stop if the presence of gas is evident
 - Eye irritation
 - Odor
 - By mechanical methods only
 - All-terrain vehicle
 - Tractor with cutting wheel
 - Each panel must be cut lengthwise
 - No exemptions for fields less than 1 acre



5. Tarp Shallow Bed



3CCR §6447.3 (a)(4)

Tarp/Shallow/Bed

3CCR §6447.3 (a)(4)



- **Maximum Application Rate**

- DPR Regulation :

- 250 pounds *Active Ingredient/acre*

- Label Requirement: (varies by product)

- Measured in pounds of *Product/acre*
 - (convert to pounds of *Active Ingredient/acre*)

- Follow the more restrictive maximum rate.

Tarp/Shallow/Bed

3CCR §6447.3 (a)(4)



- Tractor Equipment

- Rearward-curved (swept-back) chisels shall be used with either:
 - Closing shoes and compaction roller or,
 - Bed shaper or,
 - Combination bed former and bed shaper
- Injection depth: 8 - 15 inches
- Injection spacing: 12 inches or less

Tarp/Shallow/Bed

3CCR §6447.3 (a)(4) (F)



- REI:

- When tarps **are removed** before planting

1. 2 methyl bromide air samples must be taken at least 15 minutes apart and indicate a less than 1ppm for tarp removal to begin
2. Tarp removal can not begin sooner than 24 hours after holes have been cut for planting

Or

REI ends at the completion of tarp removal and REI must be at least 6 days.

Tarp/Shallow/Bed

3CCR §6447.3 (a)(4) (F)



- REI:

- When tarps **are not removed** before planting

- The tarp is not cut until at least 5 days (120 hours) following completion of the injection plus an additional 48 hours after holes have been cut for planting,

Or

- REI is 14 days, and test less than 5 ppm before planting begins

Tarp/Shallow/Bed

3CCR §6447.3 (a)(4) & Recommended Permit Condition 7.3.2



- Tarps that **Qualify** for any reduction in buffer zone distance must :
 - Not be perforated until 9 days (216 hours) have passed since the end of the application.
 - Remove tarp no sooner than 24 hours after perforated
 - Must have 2 consecutive air samples below 5ppm
 - REI:
 - Starts at injection
 - Ends after tarp removal
 - Minimum of 10 days (240 hours)

Tarp/Shallow/Bed

3CCR §6447.3 (a)(4) & Recommended Permit Condition 7.3.2



- Tarps that **Do Not Qualify** for any reduction in buffer zone distance must :
 - Not be perforated until 5 days (120 hours) have passed since the end of the application.
 - Remove tarp no sooner than 24 hours after perforated
 - Must have 2 consecutive air samples below 5ppm
 - REI:
 - Starts at injection
 - Ends after tarp removal
 - Minimum of 6 days (144 hours)

Tarp/Shallow/ Bed

3CCR §6447.3 (a)(4) & §6784 (b)(4)



- Tarp cutting and/or removal procedures
 - Must stop if the presence of gas is evident
 - Eye irritation
 - Odor
 - No exemptions for fields less than 1 acre



6. Tarp Deep Broadcast



3CCR §6447.3 (a)(5)

Tarp/Deep/Broadcast

3CCR §6447.3 (a)(5)



- **Maximum Application Rate**

- DPR Regulation :

- 400 pounds Active Ingredient/acre

- Label Requirement: (varies by product)

- Measured in pounds of Product/acre

- (convert to pounds of Active Ingredient/acre)

- Follow the more restrictive maximum rate.

Tarp/Deep/Broadcast

3CCR §6447.3 (a)(5)



• Tractor Equipment

- Forward-curved chisels used with either:
 - Air fan dilution system on application tractor
 - or
 - Closing shoes and compaction roller
- Injection depth: minimum of 20 inches but not to exceed 24 inches
- Shank spacing should be equal to the application depth, but may be up to 1½ times the application depth
- Injection spacing: 66 inches or less
- Tarp laid simultaneously by application tractor

Tarp/Deep/Broadcast

3CCR §6447.3 (a)(5) & Recommended Permit Condition 7.3.2



- Tarps that **Qualify** for any reduction in buffer zone distance must :
 - Not be perforated until 9 days (216 hours) have passed since the end of the application.
 - Remove tarp no sooner than 24 hours after perforated
 - Must have 2 consecutive air samples below 5ppm
 - REI:
 - Starts at injection
 - Ends after tarp removal
 - Minimum of 10 days (240 hours)

Tarp/Deep/Broadcast

3CCR §6447.3 (a)(5) & Recommended Permit Condition 7.3.2



- Tarps that **Do Not Qualify** for any reduction in buffer zone distance must :
 - Not be perforated until 5 days (120 hours) have passed since the end of the application.
 - Remove tarp no sooner than 24 hours after perforated
 - Must have 2 consecutive air samples below 5ppm
 - REI:
 - Starts at injection
 - Ends after tarp removal
 - Minimum of 6 days (144 hours)

Tarp/Deep/ Broadcast

3CCR §6447.3 (a)(5) & § 6784 (b)(4)



- Tarp cutting and/or removal procedures
 - Must stop if the presence of gas is evident
 - Eye irritation
 - Odor
 - By mechanical methods only
 - All-terrain vehicle
 - Tractor with cutting wheel
 - Each panel must be cut lengthwise
 - No exemptions for fields less than 1 acre



7. Drip System- Hot Gas



Application Method No Longer Allowed Due To Federal Label Changes

3CCR §6447.3 (a)(6)

Handlers and Application Equipment



Handlers



Driver



Co-Pilot



Handlers



Shoveler



Tarp Remover



Handlers



End shoveler

Co-pilot

Air Fan Dilution

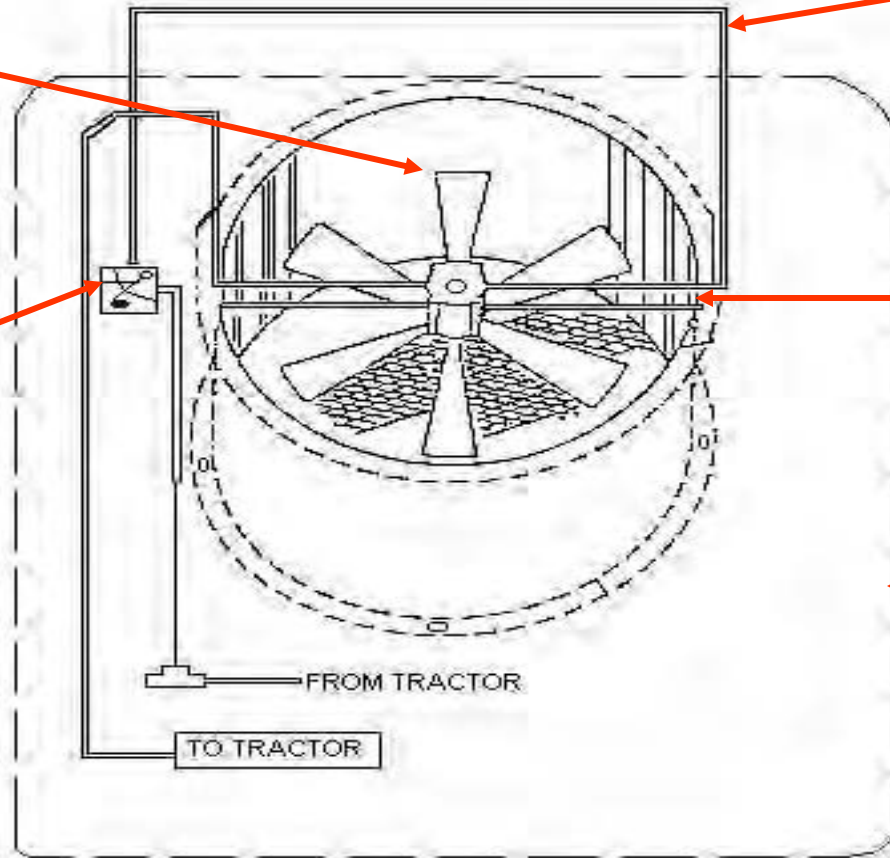


Air Fan Dilution



**SIX BLADE
AXIAL FAN
0-45 MPH
At least 43
inches wide**

**SPEED
SWITCH**



**3500 PSI
HYDRAULIC
HOSE (TYP)**

**FAN
STABILIZER**

**CANOPY
ROOF**

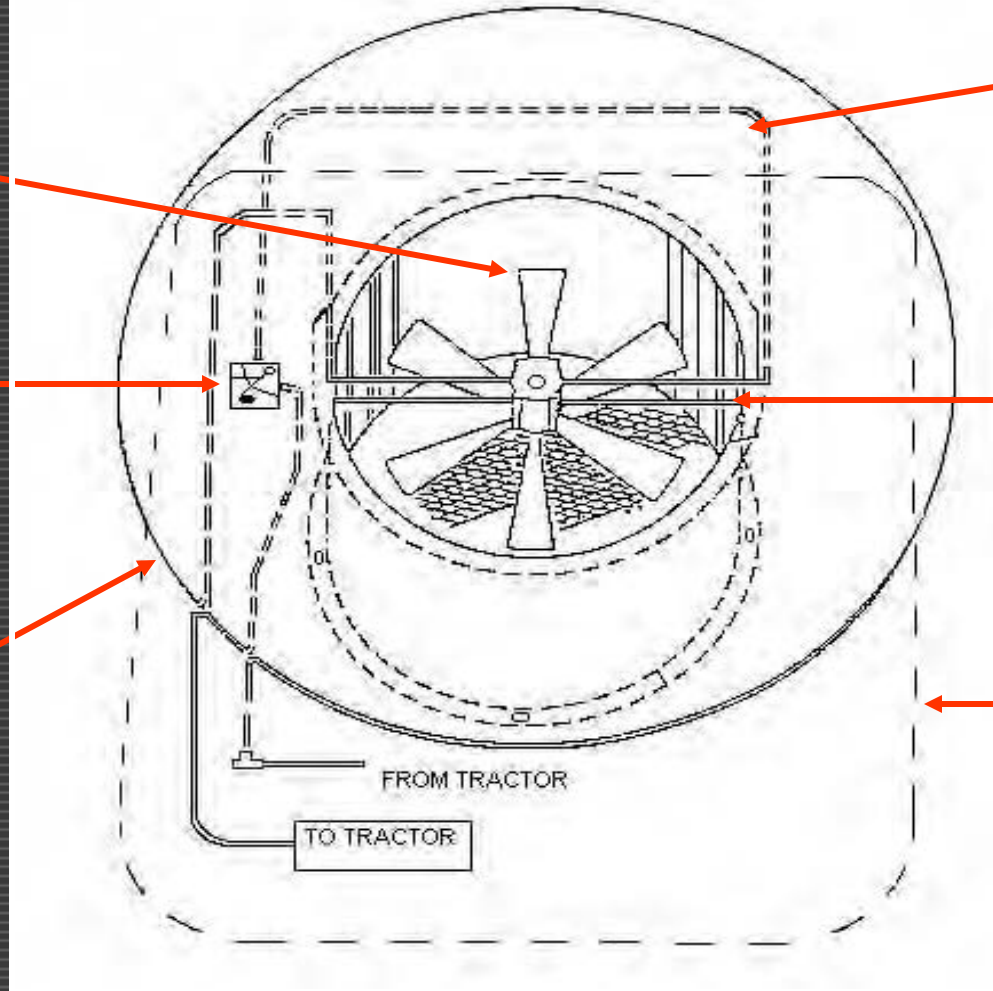
Air Fan Dilution



**SIX BLADE
AXIAL FAN
0-45 MPH
At least 43
inches wide**

**SPEED
SWITCH**

**BRIM
FLANGE**



**3500 PSI
HYDRAULIC
HOSE (TYP)**

**FAN
STABILIZER**

**CANOPY
ROOF**

Forward-Curved Chisel

Injection
Tube



Forward-Curved Chisel

Nontarp/Deep/Forward-Curved Chisel



**Closing
Shoes**

Chisel, notice the length, at least 20 inches

Modified Noble Plow



MeBr

Injection Tube

Chisel

Horizontal V-shaped Blades

Noble Plow: Tarp/Shallow



Bed Shaper

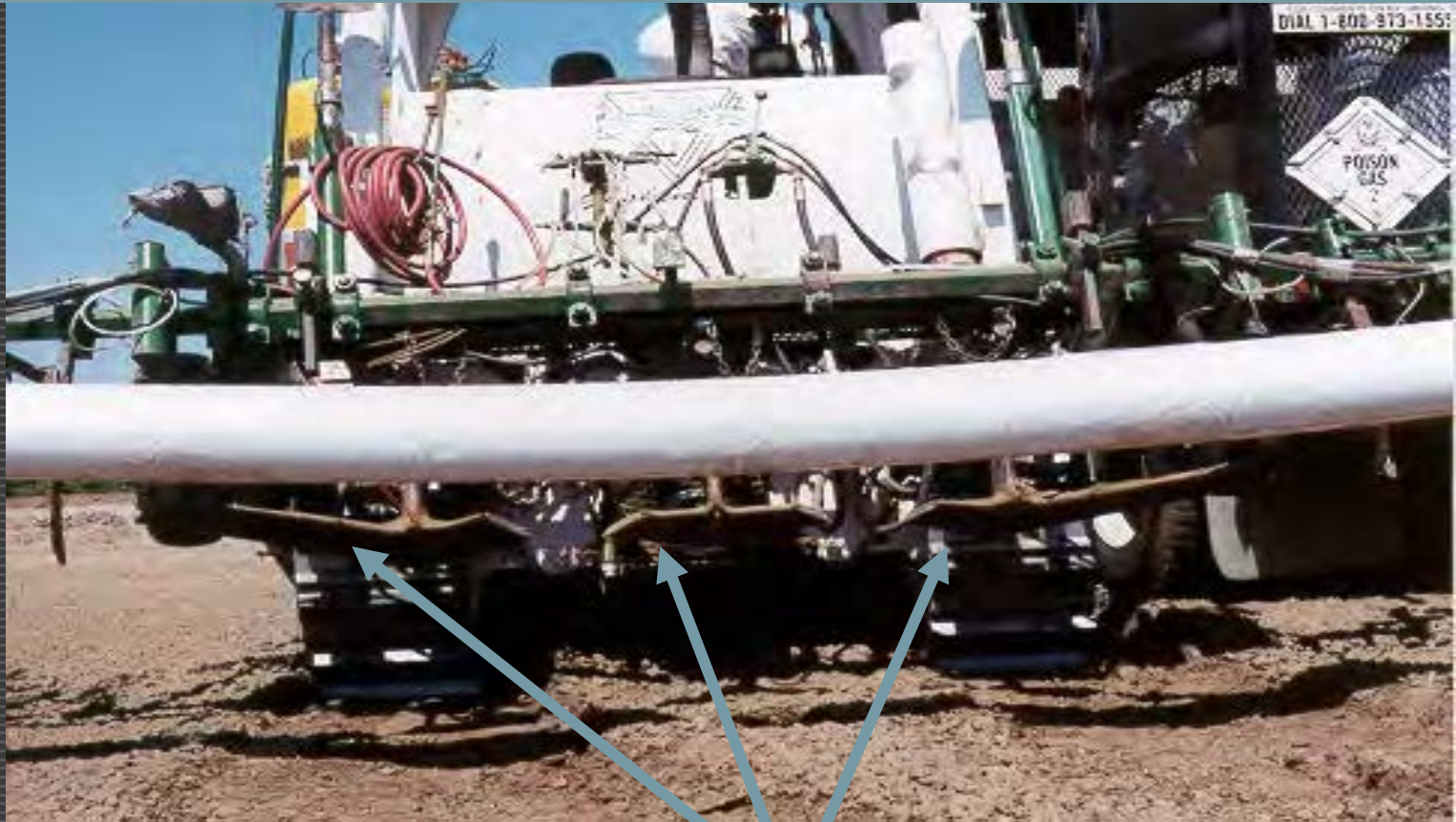
**Chisel: Horizontal
V-shaped Blades**

Modified Noble Plow



Modified
Noble Plow

Modified Noble Plow



Horizontal V-shaped Blade

Forward-Curved Chisel



Tire is Closing Shoe

Chisel

Forward-Curved Chisel

Compaction
Roller



Forward-Curved Chisel

Rearward-Curved Chisel



**Bed
Shaper**

Rearward Curved Chisel

Closing Shoes

Rearward-Curved Chisel



Rearward-Curved Chisel



Bed Shaper

Rearward-Curved Chisel

The End



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