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

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.
- 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
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 Bed Shallow

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)
• 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.
Tractor Equipment

- Application shall be made using either:
  - Air fan dilution system on application tractor, and a plow consisting of horizontal v-shaped blades;
  - 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
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 5 ppm
- REI:
  - Starts at injection
  - Ends after tarp removal
  - Minimum of 10 days (240 hours)
• 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 5 ppm.
  - REI:
    - Starts at injection
    - Ends after tarp removal
    - Minimum of 6 days (144 hours)
• 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.
• **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
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.
• 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
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)
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)
• **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.
• 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
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).
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)

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

3CCR §6447.3 (a)(6)

Application Method No Longer Allowed Due To Federal Label Changes
Handlers and Application Equipment
Handlers

Driver

Co-Pilot
Handlers

Shoveler

Tarp Remover
Handlers

End shoveler

Co-pilot
Air Fan Dilution

Air Fan Dilution
Diverter for Co-Pilot

Brim Flange

Plow
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

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

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

Disc

Bed

Shaper

Rearward Curved Chisel

Closing Shoes
Rearward-Curved Chisel Bed Shaper

Rearward-Curved Chisel

Bed Shaper

Rearward-Curved Chisel
The End

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