Fogging & Spot Fumigation
Fogging & Spot Fumigation

What is Fogging?

- Use of a pesticide in **ULV** form.

- Used to keep insect levels manageable.

- Primarily used with a contact insecticide.

- Must be a supplement to **proper sanitation**, crack and crevice, and spot fumigation.

- Best at times to maintain a routine fogging schedule.
Fogging & Spot Fumigation

Ultra Low Volume

- Liquide pesticide in the form of micron-sized droplets
  - Uses large volumes of air at low pressure to create droplets.
  - Typically 1-150 microns.
Fogging & Spot Fumigation

What a Fogging is not…

…A Fumigant

- Liquid form, not a gas
- Less effective.
- Less expensive.
- Residue issues.
- Not a “One size fits all” solution
Types of Fogging

**Cold Fog**
- Use for Pyrethrin, Conquer, Vapona and IGRs
- Motor and nozzle designed to pressurize low volumes of air

**Thermal Fog**
- Use for Pyrethrin Only
- Uses heat to vaporize
- Not for IGRs or Conquer
- Not recommended for Vapona
Type of Fogging

Type of Foggers

- Electric
- Cylinderized
- Thermal
- Portable
- Fixed
Types of Foggers

Electric

- Cold Fog
- Somewhat portable
- Adjustable droplet size
- 1(+) gallon capacity

Cons
- Require energy source
- Fogger can overheat
- Dispersion issues
Types of Foggers

Electric
Types of Foggers

Electric

General Mill Temporary Mapping

Filter

Foggers

Purifiers

Rebolt Sifter

Dusters

Outlet (Pigtail Required)

Legs

Food Protection Services
Types of Foggers

Cylinderized

- Cold Fog
- Pressurized with CO2 – good dispersion
- No energy source needed

Cons
- More expensive
- Difficult to build inventory
Types of Foggers

Cylinderized
Types of Foggers

- Thermal
  - Hot fog
  - Portable
  - Smaller droplets (<50 Microns)

Cons
- Fire / Explosion concerns
- Pyrethrins only
- Applicator exposure
Types of Foggers

- **Portable**
  - Portable
  - Use in large or congested areas

**Cons**
- Applicator exposure
- Efficacy
- Fire/Explosion Concerns
Before you Fog

Start with the insect first!
Before you Fog

Start with the insect first!
Before you Fog

Start with the insect first!

***Fogging only targets active stages.***
Before you Fog

Requirements for Re-entry

*Difference chemicals require different re-entry periods.*

- **Conquer, Kicker, Gentrol**
  - Keep area closed for 30 min after application
  - “Ventilate thoroughly before re-entry.”

- **Pyrethrin**
  - Keep area closed for 1 hour after applications
  - “Ventilate thoroughly before re-entry.”

- **Vapona DDVP**
  - No entry w/o PPE for 24 hours
  - OR - Use of detection tubes to determine presence of Vapona
Before you Fog

Considerations for Success

- Is facility in good sanitation condition?
- Is a crack & crevice spot fumigation necessary?
- Are food and food surfaces removed / covered?
- How much time is available?
Fogging & Spot Fumigation

Spot Fumigation
Spot Fumigation

What is a Spot Fumigation?

“Short term treatment of equipment for control of the adult and larval life stages of insects.”

“Intended to interrupt life cycles”

Must be repeated periodically to control infestation
Spot Fumigation

What is a Spot Fumigation?

Used to manage insect activity where fogging / spraying cannot be used
- Inside food processing equipment
- Grain transfer systems
Spot Fumigation

Fumigant Options

- Magtoxin Spot Fumigant
- Fumi-Cel
- ProFume
Spot Fumigation

Fumigant Options

Magtoxin

- Magnesium Phosphide pellets in a dimple “spot”
- Fastest reacting metal phosphinide on market.

Cons

- Retrieval
- Fire concerns
  - Over application
  - Moisture
Fumigant Options

**Fumi-Cel**
- Magnesium Phosphide “Cel”
- Not as fast as Spot Fumigant

**Cons**
- Retrieval
- Fire concerns
  - Over application
  - Moisture
  - Falling Over
- Cels not designed to be placed equipment along
  - Must use pouch
Spot Fumigation

Fumigant Options

- **ProFume (Pulse System™)**
  - Sulfuryl Flouride
  - Non corrosive to electronics
  - No resistance concerns
  - No retrieval concerns
Spot Fumigation

What to Fumigate
Spot Fumigation

What to Fumigate

Cleaning Section: Incoming wheat

Mill Section: Could be multiple mills; A, B, C

Bulk Lead-out: Storage Bins:

Bulk Flour
Spot Fumigation

What to Fumigate

M6 = Dusters, Dust Collection
M5 = Sifters
M4 = Purifiers or Sifters
M3 = Conveyors or Sifters
M2 = Roll Stands
M1 = Hoppers and Lifts or bucket elevators
What to Fumigate

Dust Collectors

- Different shapes and Sizes
- Can have separate compartments
  - Must be individually treated
What to Fumigate

Sifters

- Typically reblot, 4, or 6 boxes
  - Each must be treated separately
- Spots can be hung in ‘elbows’
- No sealing required
What to Fumigate

Purifiers

Requires Tarping
What to Fumigate

Dusters

Typically a vent on top that requires sealing
What to Fumigate

Screw Conveyors

Sealing not required
What to Fumigate

Roll Stands

Each side is separate, requires treatment of each side.
# What to Fumigate

<table>
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<th>SPOT FUMIGANT - FOG ACCOUNTABILITY</th>
<th>Date Placed:</th>
<th>Sealing:</th>
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<tbody>
<tr>
<td>Customer:</td>
<td>Date Removed:</td>
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<th>Type</th>
<th># Units</th>
<th># in Each</th>
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**Total Brought:**
What to Fumigate

Accountability!

- Securing Spots
- Recommend using bailing wire
- Place emphasis on securing wire before placing spot
- Place flagging on equipment and bailing wire
After Treatment

Ventilation

- Prior to treatment, identify all fans, filters, dust collection that can be used to ventilate
  - Do not turn on until after all spots are retrieved.
After Treatment

What can go Wrong?

- Health Hazards
  - Failure to retrieve
    - Product contamination
    - Product recall
    - Loss of business
  - Fire
    - Over application
    - Moisture
Pulse Fumigation System™

Significant Challenges

- High flammability
- Releasing gas from inside a structure
- Maintaining efficacy
- Loosing fumigant in equipment / systems
- Corrosive to electronics
Significant Challenges

- Vapona - DDVP
  - Lower efficacy
  - Application Exposure
  - Residual – Organophosphate
  - Equipment and Reliability
  - Slow equilibrium
  - Noticeable odor
Pulse Fumigation System™
Pulse Fumigation System™: The simplest explanation

- You replace magnesium phosphide spot fumigation and fogging with one gas fumigant – Sulfuryl fluoride (ProFume®).
- You apply gas in equipment at higher concentration to achieve an improved kill rate in processing system.
- You pulse gas in equipment to maintain concentration over time.
- What leaks out into open space will result in an adult kill like a fogging.
Pulse Fumigation System™
Pulse Fumigation System™

Significant Improvements

- Remote Application
- Non-flammable application
- No risk of losing fumigant in equipment
- Variable control of application
- Application for outside
- No liquid pesticides used
- Higher efficacy
Pulse Fumigation System™

Safety & Efficacy is our GOAL

- Higher Efficacy
- Penetration
- System Saturation
Pulse Fumigation System™
Pulse Fumigation System™
Pulse Fumigation System™

Application performed safely outside

- Flow controllers
- Solenoid valves
- Percentage timers
- Shorter treatment times: 36, 24, 12 hours
Pulse Fumigation System™

Monitoring will guide higher performance

- One gas monitor
- Inside Equipment
- Open space
- Data collected remotely
Pulse Fumigation System™

Graph

Concentration

Time

Pulse Fumigation System™
Pulse Fumigation System™

Tailings Improvements

- 29% of 2016
- >3 fold reduction
Pulse Fumigation System™

Pheromone Counts Down Significantly

Pheromone Counts

January February March April May

2016 2017

Food Protection Services
Pulse Fumigation System™

Summary

1. Safety: Not in the fumigated area during application
2. Penetration
3. Higher Efficacy in equipment through pressurization
4. Non-flammable
5. Shorter treatment times (36 to 24 to 12)
6. Control over success of treatment
7. No disposal
8. Rodent efficacy rates
9. As milling equipment automates – SF is a none corrosive gas
10. Coast varies but is usually 20% higher
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