Seed Treatment Safety and Regulations – Crop Protection Perspective

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Objectives

The objectives of this presentation are to...

- Describe seed care product health hazards and exposure pathways
- Help you understand how these hazards are communicated and managed
- Review recommended engineering controls, work practices and personal protective equipment

Treating Equipment

Bagging Equipment

Possible Seed Care Products Health Effects

- Skin and eye irritation
- Skin sensitization
- Toxic effects (nervous system, other organs).

Chemical Exposure Pathways

- Inhalation of dust or mists
- Skin absorption
- Ingestion

Sources of Hazard Information

- Material Safety Data Sheets (MSDSs)
- Product Labels

Material Safety Data Sheets

- Detailed hazard information document
- Used for many purposes – worker protection, emergency medical response, spill cleanup, transportation, disposal
- Intended audience - manufacturing and formulation sites, emergency responders, HSE personnel

Product Labels

- Signal word and warning language dictated by EPA risk assessment
- Simplified instructions, minimal detail
- Intended audience - end users of the product (seed treatment applicators in this case)

EPA Risk Assessment Concepts

- Label PPE requirements are based on risk assessment models (toxicity, physical /chemical properties, use patterns)

- Philosophy --- Rely primarily on PPE, with limited engineering controls (“closed system” concept)

- Typically overprotective, to account for variable effectiveness of PPE

- Rules apply to entire industry regardless of specific exposure conditions

- End result: conservative control requirements that are relatively simple, but inflexible.

Example: EPA Label PPE Requirements for Avicta® Duo Corn

- Seed Treatment Chemical Operators
  - Long sleeves and long pants, shoes and socks
  - Gloves
  - Dust respirator (dust mask or cartridge mask)

- Baggers and Sewers
  - Long sleeves and long pants, shoes and socks
  - Dust respirator (dust mask or cartridge mask)

- Loader / Operators and Planters
  - Long sleeves and long pants, shoes and socks
  - Gloves

Syngenta Guidelines for Airborne Exposure

- Syngenta Occupational Exposure Limits (OELs), set to protect workers for a lifetime of exposure (8 hrs/day, 40 days/week)

- We share OELs with downstream handlers as stewardship best practice guidance (via MSDSs)

- Example: Abamectin OEL = 0.02 mg/m^3 (8-hour average level in air) to prevent long term nervous system effects.

Measuring Treatment Chemical Air Levels

Standard Air Monitoring Procedure

- Personal air monitoring for total dust (includes target chemical, seed dust, other treatments)
- Chemical analysis for the target chemical fraction of the total dust captured
- HSE provides technical support for customer air quality monitoring.

Managing Exposure – 4 Elements

- ENGINEERING controls prevent chemical release – protection is built into the process

- WORK PRACTICES are procedures taken to minimize chemical contamination during normal work tasks

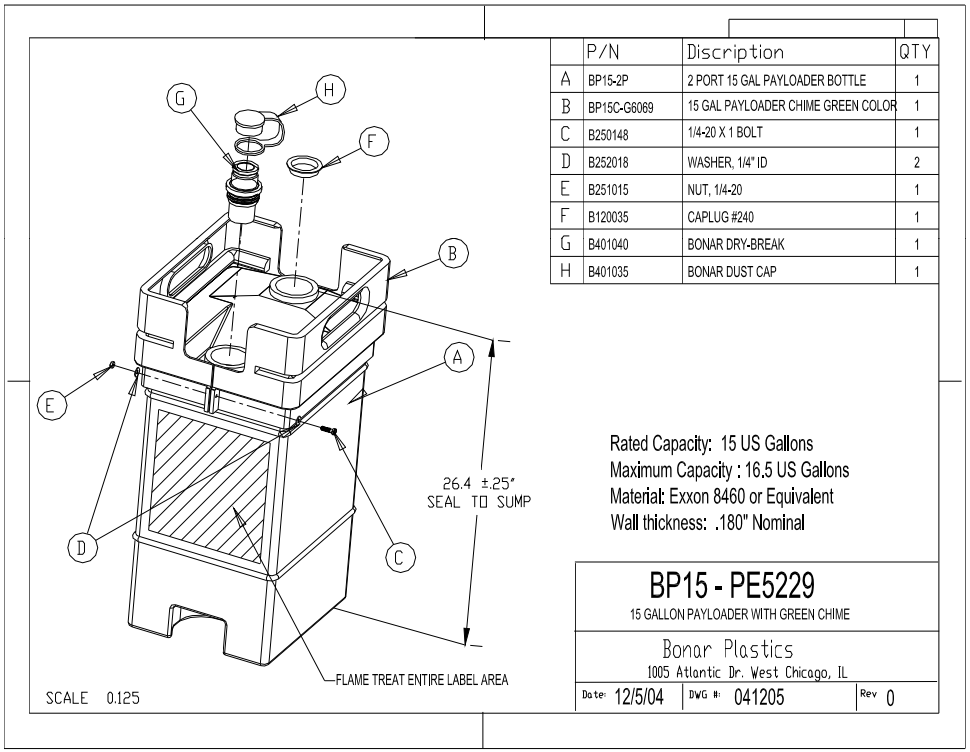
- PERSONAL HYGIENE controls are steps to reduce accidental transfer of hazardous materials to personnel, food, clothing, vehicles, etc

- PERSONAL PROTECTIVE EQUIPMENT is worn as an additional protective measure to minimize exposure – accidental or routine.

1. Engineering – Chemical Mixing & Treater Operation

- Maintain “Closed” chemical transfer system
- Keep treater closed to prevent mist or dust escape
- Immediately address leaks or spills to minimize clean-up.

“Closed System” Treatment Concept



	P/N	Discription	QTY
A	BP15-2P	2 PORT 15 GAL PAYLOADER BOTTLE	1
B	BP15C-G6069	15 GAL PAYLOADER CHIME GREEN COLOR	1
C	B250148	1/4-20 X 1 BOLT	1
D	B252018	WASHER, 1/4" ID	2
E	B251015	NUT, 1/4-20	1
F	B120035	CAPLUG #240	1
G	B401040	BONAR DRY-BREAK	1
H	B401035	BONAR DUST CAP	1

Rated Capacity: 15 US Gallons
Maximum Capacity : 16.5 US Gallons
Material: Exxon 8460 or Equivalent
Wall thickness: .180" Nominal

BP15 - PE5229
15 GALLON PAYLOADER WITH GREEN CHIME

Bonar Plastics
1005 Atlantic Dr. West Chicago, IL

Date: 12/5/04 | DWG #: 041205 | Rev 0

Engineering – Dust Control

- Effective dust control requires containment and local exhaust ventilation
- Dust reduction is the primary goal in managing seed treatment exposure
  - Treater
  - Conveyor transfer points, belts, screens
  - Bagging stations
  - Dumping back treated seed

Manual Bagging – Typical Arrangement

- Hood attached to bagger, or suspended alongside bagger

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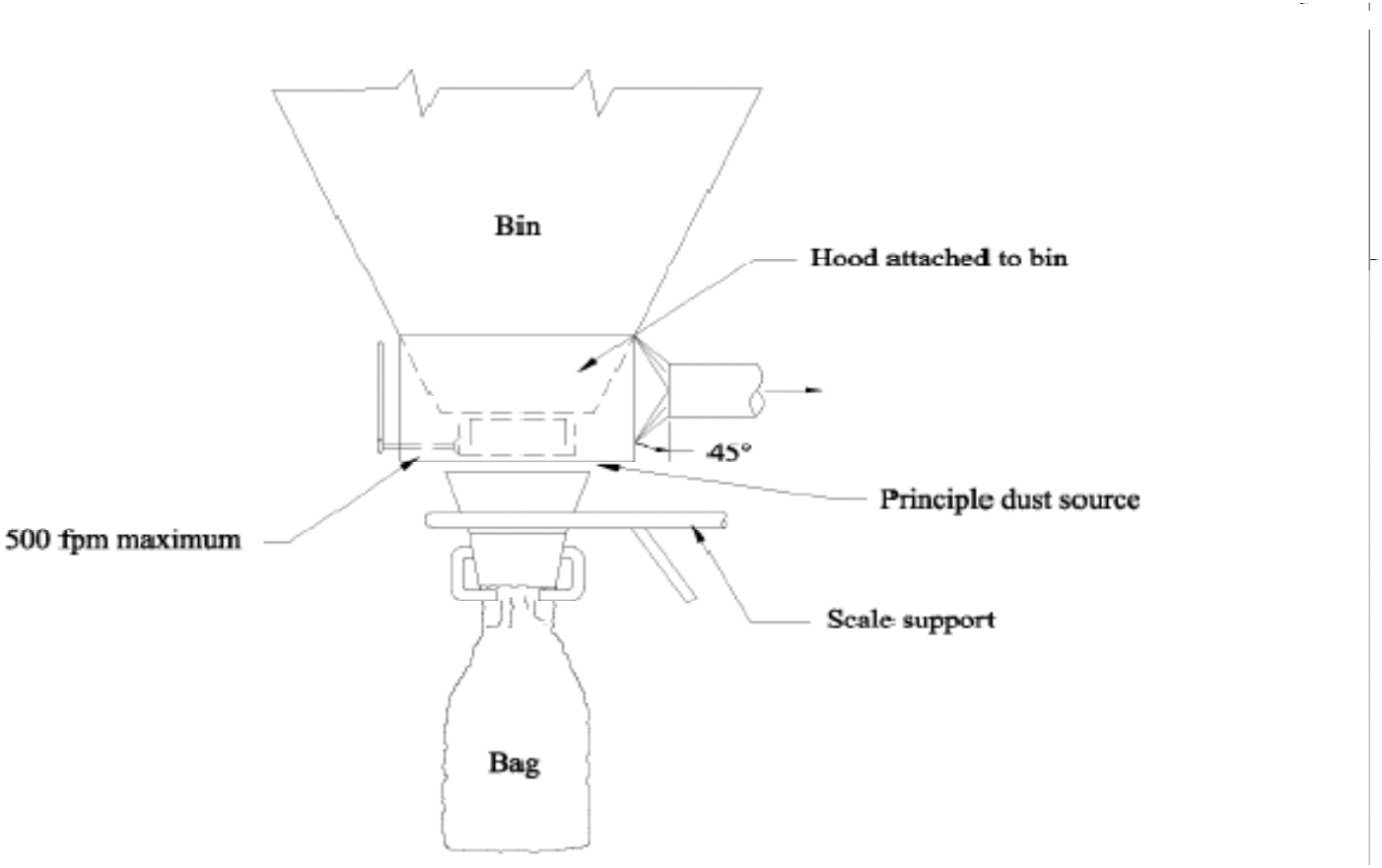
Recommended Manual Bagging Ventilation

Good pick-up and work practices required for control below some OELs (e.g abamectin)



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Automatic Bagging Systems

- Preferred for high production operations, containment minimizes worker exposure and work area contamination issues

- Enclose bagger

- Fit with local exhaust ventilation

Manual Dumping Treated Seed

- Potential high dust operation
- Exhaust ventilation necessary at dump station
- Good work practices control dust and minimize clean-up

Automatic Bag Breaking

- Preferred method for high volume re-work
- Reduces dust exposure and ergonomic issues associated with manual dumping

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Dust Collection System Design

- Construct collection systems according to established design principles
- Select an efficient baghouse or cartridge filter dust collector
- Discharge exhaust outside building
- Obtain required air permit approvals
- Routinely inspect and maintain system to optimum performance

Air Emissions Controls

- Local permit rules may vary – consult with specific state agencies for permit requirements

Air Emissions Controls

- Discharge filtered air outdoors

- Recirculation is NOT recommended

2. Work Practices

Operating Treaters

- Keep equipment closed when operating to prevent splashes
- Use care in opening / observing operations
- Wear proper PPE to protect eyes and body
- Clean up spills promptly to minimize dust contamination
- Clean tools after use to prevent transfer of treatment residues to other equipment

Work Practices

Handling freshly treated seed

- Damp, freshly treated seed presents a minimal exposure hazard
- Wear PPE according to the label
- Identify leaks in transfer equipment and repair them promptly
- Clean up spilled seed promptly to minimize slipping hazards and work area contamination

Work Practices

Bagging / dumping back treated seed

- Dumping back dry treated seed requires careful work practices to control exposure
- Handle empty bags carefully and place them in disposal bags immediately after emptying
- Wear respirator and protective clothing as required by the label

Work Practices

Maintenance (repair and adjustments to equipment)

- Minimize use of compressed air to clean equipment and dislodge seed – compressed air spreads dust
- Minimize sweeping – it spreads dust too
- Use HEPA filter vacuum cleaning equipment as much as possible
- Clean tools immediately after use to prevent contamination of other equipment and transfer to hands, etc.
- Wear appropriate personal equipment – follow the label

3. Personal Hygiene

- Restrict eating, drinking and smoking
- Provide suitable washing and clean-up facilities
- Require workers to clean up before leaving work
- Work clothes or uniforms
- Dedicated work shoes
- Don’t take chemicals home !

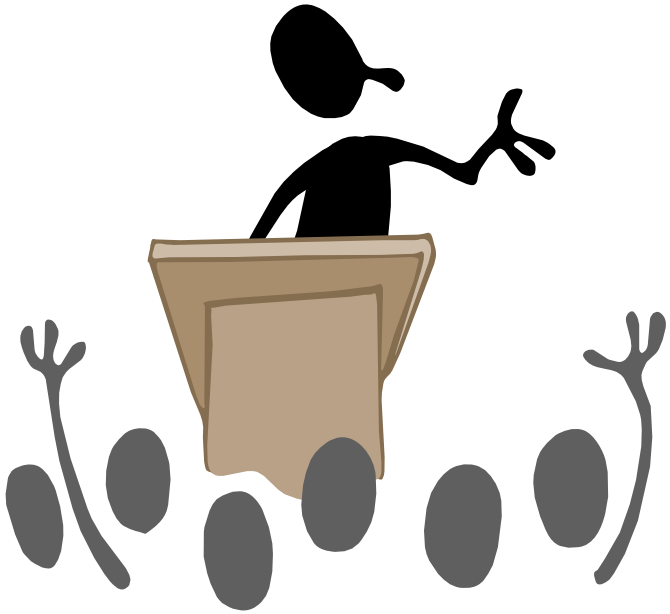
4. Personal Protective Equipment

- Conduct a risk assessment to determine PPE requirements
- Follow EPA label precautions at a minimum
- Train workers how to use and maintain PPE
- Site respirator programs must meet OSHA standards (including: written program, medical certification, training, fit testing)
- Review program effectiveness

Summary

- Good chemical management practices are recommended for all seed care products
- Investments in worker safety will ensure protection and provide confidence for handling a wide range of products
  - Increased worker awareness
  - Tighter workplace exposure controls
  - Improved enforcement of PPE and personal hygiene rules

Any Questions ?



Thanks !

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