Seed Treatment Stewardship and PPE
Introduction

• Seed treatments are increasingly used to demonstrate value to growers
• To that end, we have seen an increase in the number and types of products applied to seed
  • Fungicides
  • Insecticides
  • Nematicides
  • Biological products that perform a number of beneficial functions
• As a result, it is important to re-think how we handle seed treatments and treated seed
  • Proper application of products to ensure that the products work
  • Proper handling to minimize exposure to products
Internal and External Actions Taken

• In order to raise awareness, externally we have
  • Created on-line PPE training available at
  • Direct mailing to growers on importance of PPE
  • Required in person PPE training in order to schedule delivery of product
  • Added PPE callout in all advertising

• The rest of this presentation will focus on internal actions taken which includes upstream
What is Bayer Doing Internally?

- Management of Change (MOC) enhancements
- Treating PPE Matrix
- Authorization process built
- Conversations on secondary transfer
Hazards Vary Across the Site
Safe Handling of Seed Treatment and Chemical Operations in Bayer Seed Sites:

Learnings:
- Clarification of PPE and dress code at the sites
- Better definition of where there is potential for exposure and aligning PPE with risk assessment
- MOC process enhanced

Seed Treatment Authorization Process:
- Assessment of chemical operations in the site and development of an inspection process for managing seed treat and handling of treated seed
- Expectation is that all sites are authorized

Minimize Exposure
- Proper usage of PPE and good hygiene practices
- Uniforms?
- Investigating different cleaning methods
• Recommend a thorough review of all seed treatment labels
MOC Process Change

• Background: an MOC is done for changes to the process (i.e. new chemicals, new equipment, etc)

• MOC Enhancements
  • Formal presentations on readiness
  • Formal sign-offs
  • More site training
  • All technicians sign the MOC
  • Start-up support determination included
Workers in any manufacturing operation involved in the handling of seed treatments or treated seed must wear safety glasses with side shields, long-sleeved shirts, long pants, shoes and socks. Beyond these dress code requirements, sites must follow the PPE requirements specified on the pesticide labels for all seed treatments they are using. The following table identifies the minimum PPE requirements for the job tasks involved in our 2018 seed treating operations, which in some cases go beyond the explicit label requirements. Each manufacturing plant should conduct a risk assessment of its unique operations to identify whether PPE beyond what is identified below is warranted. This guidance should be reviewed at least annually.

<table>
<thead>
<tr>
<th>Potential Exposure</th>
<th>Operational Activity</th>
<th>PPE Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Liquid</strong>*</td>
<td>Treater operations and sampling</td>
<td>Universal &gt;14 mil gloves; Face shield</td>
</tr>
<tr>
<td></td>
<td>If there is a possibility of liquid splashing on face</td>
<td>Chemical resistant coverall or chemical resistant sleeves; Chemical resistant footwear</td>
</tr>
<tr>
<td></td>
<td>If task requires reaching into treater or possibility of liquid splashing on arms</td>
<td>Chemical resistant coverall; Chemical resistant footwear; Powered Air Purifying Respirator (PAPR)</td>
</tr>
<tr>
<td></td>
<td>Universal</td>
<td>Chemical resistant coverall; Chemical resistant footwear</td>
</tr>
<tr>
<td></td>
<td>If there is a possibility of getting enough material on coverall to require extra protection against skin contact</td>
<td>Double gloves</td>
</tr>
<tr>
<td></td>
<td>Universal &gt;14 mil gloves; Face shield; Chemical resistant coverall; Chemical resistant footwear</td>
<td></td>
</tr>
<tr>
<td></td>
<td>If there is a possibility of liquid splashing on shoes</td>
<td>Chemical resistant footwear</td>
</tr>
<tr>
<td></td>
<td>Universal Work gloves</td>
<td></td>
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<tr>
<td></td>
<td>If there is direct handling of treated seed</td>
<td>&gt;14 mil gloves</td>
</tr>
<tr>
<td></td>
<td>Universal &gt;14 mil gloves; Chemical resistant coverall; Chemical resistant footwear</td>
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<tr>
<td></td>
<td>If blowdown takes place in a seed bin</td>
<td>PAPR</td>
</tr>
<tr>
<td></td>
<td>Universal &gt;14 mil gloves</td>
<td></td>
</tr>
<tr>
<td><strong>Dust</strong></td>
<td>Bagging and sewing; Treater control room; Lab and quality testing activities</td>
<td>Universal Work gloves</td>
</tr>
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<td></td>
<td>If there is direct handling of treated seed</td>
<td>&gt;14 mil gloves</td>
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* All treatment area workers must wear safety goggles when using Acceleron E-522 SAT or Peridiam Precise 1010. All treatment area workers must wear respirators in the following situations:
1. Using Poncho VoTivo and site has not demonstrated adequate engineering controls;
2. Using DX-109 and site is doing multiple commercial seed treatment activities.
Internal Authorization Process

All internal sites must be authorized and all tollers must get awareness training

Process:

• Gap analysis drives conversation
• Manufacturing leadership owns with support from ESH
• Site visit with documentation, demonstration and tour of all aspects of treating and bagging
• PPE being used is verified
What else are we doing internally?

• Training on donning and doffing PPE
• Conversations about dedicated spaces for donning and doffing
• Uniforms instituted
• Conversations about secondary transfer
Thank You