Allocation of Risk Mitigation Measures – UK’s perspective

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Operators

- Tiered approach to PPE refinement options as reflected in UK POEM
- Assigned Protection Factors (APFs) – conservative default values
- PPE design and construction meet relevant standards
- Assumes operators are trained
- Assumes PPE fit well, are well maintained and appropriate for the task involved
UK POEM: PPE options

• Mixing liquid concentrates
  – Gloves (5% or 10% penetration/transfer)

• Mixing solid concentrates
  – Gloves (1% penetration/transfer)
  – RPE (using HSE APF values)

• Application
  – Gloves (10% penetration/transfer)
  – Coated coveralls for knapsack and hand-held CDA (5 penetration/transfer)

• No PPE options for home-garden use

• Closed cab for orchard uses: 5% PDE/PIE
Bystanders/residents

• Bystander (adult)
  – dermal exposure to spray drift
  – assumed to be lightly clothed
  – no clothing reduction factor

• Resident (child)
  – dermal exposure to drift fallout on lawns
  – no clothing reduction factor
Workers

- Re entry into treated crop or area
- Handling treated material
Workers

• Work wear
  – Outdoors: full length clothing generally assumed i.e. arms, body, legs covered (bare hands)
  – Indoors: minimal clothing more likely i.e. shorts and t-shirt

• Gloves
  – UK does not assume any protection from gloves
Workers

• Horticultural Development Company survey
  – 4 grower groups:
    • carrots (11 sites),
    • *Choisya* (11 sites),
    • cucumbers (20 sites)
    • daffodils (27 sites)

• Main conclusions
  – Glove use variable to non existent. Not CE standard chemical resistant gauntlet gloves
  – Training of highly variable or non existent.
  – Each sector different ‘one size does not fit all’
Workers

- UK aware that some MS mitigate risk this way but is this justified?
  - What PF? 95% reduction from gloves equivalent to APF of 20!
  - Assumes CE standard chemical resistant gloves are worn
  - Assumes worker fully trained in their use and aware of the risks involved
  - How is the PF applied to the TC value?
Workers

• Non PPE gloves – what protection factor?
  – HSE funded R&D study (‘Chemical Protective effects of ‘non-PPE’ gloves in greenhouse workers’)
  – Calculate a single generic chemical protection factor (PF) for non PPE gloves
  – Compare with protective effect of chemical resistant PPE gloves
  – 5 nurseries, 36 subjects, 6 glove options, same task, transfer route only
  – Review of published literature
### Corrected and adjusted protection factor

<table>
<thead>
<tr>
<th></th>
<th>Gauntlet</th>
<th>Cotton</th>
<th>SRSU*</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>22</td>
<td>21</td>
<td>65</td>
</tr>
<tr>
<td>Geomean</td>
<td>60.1</td>
<td>5.3</td>
<td>32.1</td>
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<tr>
<td>GSD</td>
<td>3.0</td>
<td>2.8</td>
<td>2.6</td>
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<tr>
<td>GM 95% CI upper</td>
<td>94.4</td>
<td>7.6</td>
<td>40.8</td>
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<tr>
<td>GM 95% CI lower</td>
<td>44.2</td>
<td>3.5</td>
<td>24.9</td>
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<tr>
<td>5th percentile PF</td>
<td>10.8</td>
<td>1.3</td>
<td><strong>7.1</strong></td>
</tr>
</tbody>
</table>

* SRSU (splash resistant single use gloves) gloves for which the value presented is the combined value for vinyl, latex and nitrile glove subsets.
Workers

• Provisional ‘shopping list’ of measures to be addressed by industry:
  – Supply of gloves: quantity and quality. Whose responsibility is it?
  – Training: workers and those responsible for workers
  – Awareness of the risks
  – Safety signs
  – Regular checks