Health and Safety
Executive

HSE

Bystander & Resident Exposure to Plant Protection Products

Available Data and the EFSA Guidance

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Overview

- Regulatory objective
- Bystanders (B) and residents (R)?
- How might they be exposed?
- What data are available?
  - Potential exposures, B/R behaviour
- Assumed scenarios
  - Single/short-term/acute
  - Repeated/intermediate-term/sub-chronic
  - Children & Adults

Risk management objective

- Protect all human health
  - Ensure predicted exposures within levels expected not to cause harm
- Regulation considers operators, bystanders, workers, residents and exposure to residues on food
- Bystanders and residents must protect public from non-work and non-dietary exposures from use by others
- Consider short and longer term risks

Bystanders

- Located in or directly adjacent to area under PPP application/treatment or recent treatment
- Presence incidental
- Not work related to PPP use
- Take no action to avoid/control exposure
- Might have short-term/acute exposure

Residents

- Live, work, at school, etc adjacent to area treated with/has been treated with PPP
- Presence incidental
- Not work related to PPP use
- Take no action to avoid/control exposure
- Might be in location all day leading longer-term exposure

Bystanders and Residents

- Principles
  - Presence incidental
  - Not work related to PPP use
  - Take no action to avoid/control exposure
- Bystanders
  - In/adjacent to treated area
  - At application or soon after
  - Short term exposure
- Residents
  - Adjacent to treated area
  - Longer term exposure

Members of the Public

- Principles
  - Presence incidental
  - Not work related to PPP use
  - Take no action to avoid/control exposure
- Short term exposure
  - In/adjacent to treated area
  - At application or soon after
  - Referred to as bystanders
- Longer term exposure
  - Adjacent to treated area
  - Referred to as residents

Potential exposure

- Air
  - Droplets/particles (short term event only)
    - Skin contact/inhaled
  - Vapour
    - Inhaled
- Contaminated surfaces
  - Crop/target
    - Skin contact
  - Droplet drift deposits in adjacent area
    - Skin contact, hand to mouth, object to mouth, home garden crops

Existing data

- Vapour drift outside crop area
  - California EPA extensive monitoring programme, worst case in 1998 Report for the application and ambient air monitoring of chlorpyrifos (and the oxon analogue) in Tulare County during spring/summer 1996
  - Siebers *et al* 2003 Chemosphere 51 397-407

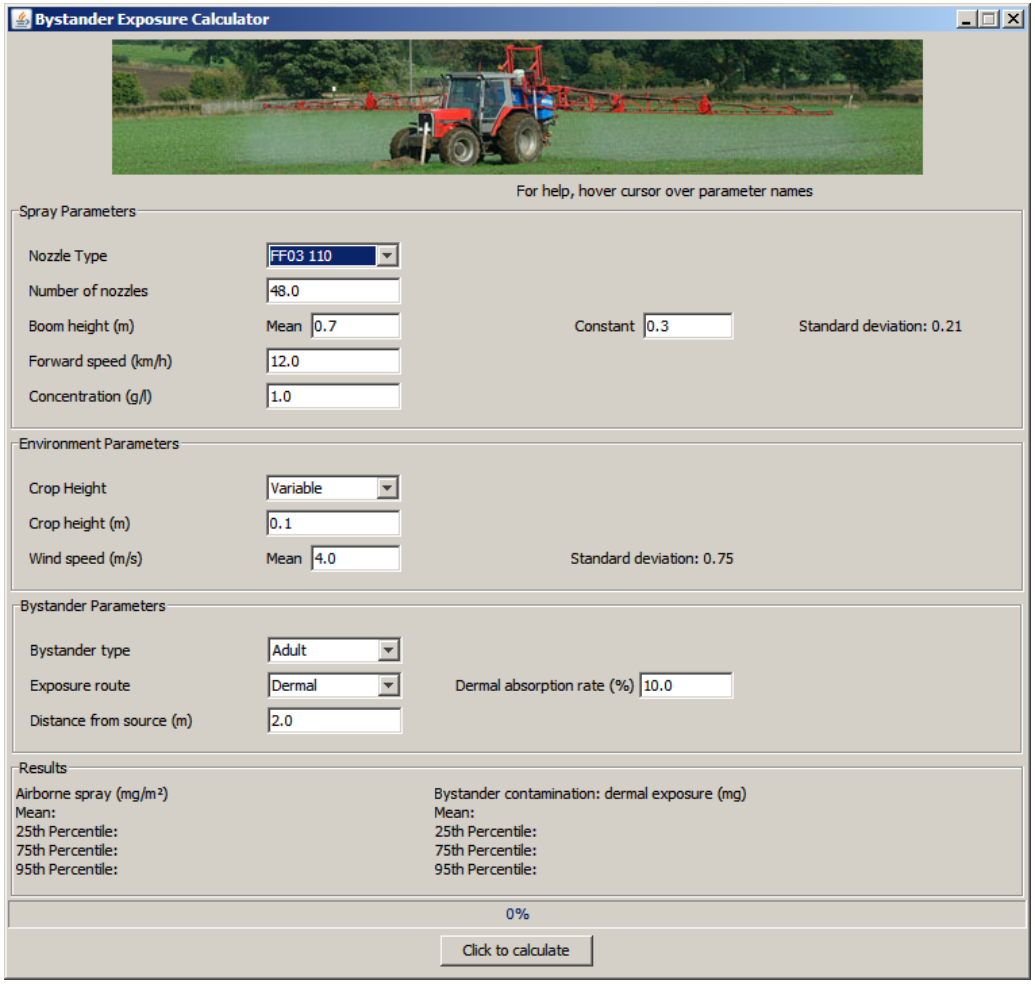
Existing data

- Guidance document is a snapshot
- Expect more from FP7 BROWSE project
- Spray drift onto adults as sprayer passes
- Spray drift onto adjacent surfaces
  - UK Government lab arable study Lloyd & Bell 1983, orchard study Lloyd *et al* 1987
  - EU SMT project SMT4-CT96-2048
  - DE BBA/JKI Basic Drift Values
  - UK BREAM project 2010

BREAM & Recent Drift Trials

Photos from (a) Fera, Defa UK, and (b & c) NIAB (Silsoe), UK

BREAM Calculator



Input values for arable crops

- Nozzle FF03110
- No nozzles 48, ie 24 metre boom
- Boom height 0.7m
- Forward speed 12.6 km/h
- Crop height short
- Wind speed 2.7 m/s
- Distance from source 2 metres (5 or 10m)

Human aspects

- Adult 60kg and child 10kg
- Short-term exposures high breathing rate
- Longer-term exposures average rate
- Light clothing over trunk

Residents/longer-term exposures

- 75th centile estimates & sum of means for total
- Spray drift
  - BREAM (arable), Lloyd *et al* 1987 (orchards)
- Vapour
  - Cal EPA & Siebers in approach by UK & DE
- Surface deposits (dermal, hand-to-mouth, object-to-mouth)
  - EFSA 2010 based on US EPA
- Entry into adjacent treated crops
  - Derived from worker inspection TC and 15 minute exposure

Members of the public

- Children playing on lawns
  - BREAM or DE Basic Drift Values
  - USA EPA dermal & ingestion exposures
  - USA activity data
    - Mouthing frequency
- Public contact with crops

Bystanders/short-term exposures

- 95th centile estimates, unrealistic to sum
- Spray drift
  - BREAM (arable), Lloyd *et al* 1987 (orchards)
- Vapour
  - Cal EPA & Siebers in approach by UK & DE
- Surface deposits (dermal, hand-to-mouth, object-to-mouth)
  - EFSA 2010 based on US EPA
- Entry into adjacent treated crops
  - Derived from worker inspection TC and 15 minute exposure

Summary

- Four pathways of exposure
- Exposures may occur during or after application
- Exposures assessed for children and adults
- Short- and longer term exposures
- Where possible 95th and 75th centiles

Thank you for your attention