



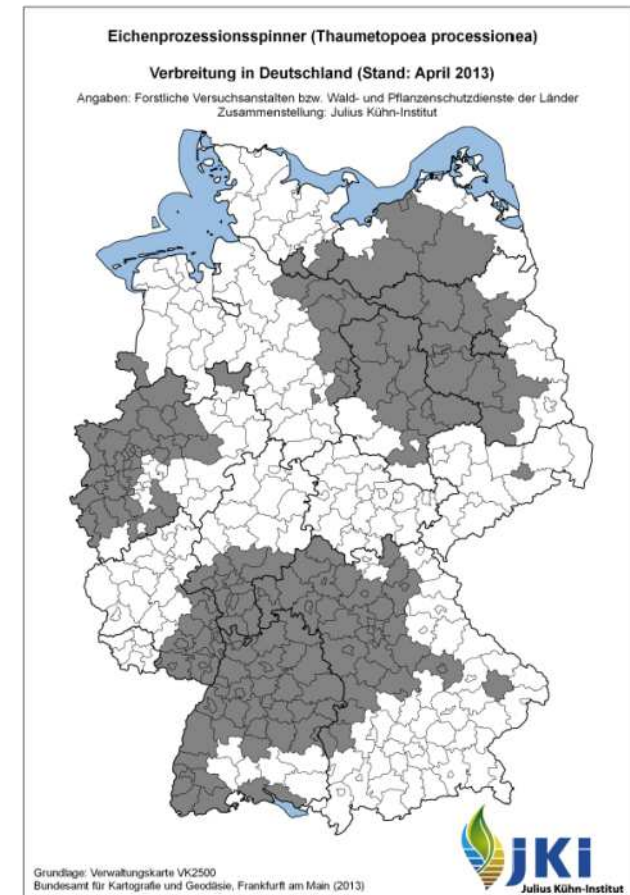
Bundesanstalt für Arbeitsschutz
und Arbeitsmedizin

Dermal and Inhalation Exposure of Workers During Control of the Oak Processionary Moth (OPM) by Spray Applications

**Dr. Michael Roitzsch
Group 4.1 „Exposure Scenarios“**

Oak Processionary Moth (OPM)

- native to central and southern Europe
- range of distribution is expanding
- caterpillars form stinging hairs
- Hazard to human health
 - skin and eye irritation
 - breathing difficulty
 - allergic reaction



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Range of OPM in Germany 2013,
Julius Kühn-Institut

Oak Processionary Moth (OPM)

- **control of OPM**
 - Insecticides (spray application)
 - removal of nests by suction
- **common active substances**
 - Margosa-extract („Neem“)
 - diflubenzuron (until 2015)
 - *B. thuringiensis* subsp. *kurstaki*



Nest from previous year, april
2014

Agents for Control of OPM : Situation in 2013

- control of OPM to prevent human health:
Biocides-Regulation
- In 2013, no authorised biocidal product for control of OPM
- several products allowed due to transitional provisions



Warning sign near Lüneburg,
may 2014

Authorisation of Biocides

- **2-step process**

1. Approval of active substances
2. Authorisation of products

- **role of BAuA Division 4**

- assessment of occupational safety and health

- **human health risk assessment**

- derivation of reference values
- **exposure assessment** for intended uses
- comparison: exposure level vs. reference value



Control of OPM by Spray Applications



vehicle-mounted spraying device



hand-held spraying device

photos: BAuA

Exposure Assessment of OPM Control

- **no suitable exposure data was available**
- **applicability of exposure models developed for plant protection products (PPP)?**
 - crops significantly smaller than oaks
 - focus on different spraying devices
 - different spraying patterns
 - different general conditions
 - (groups of) trees approached individually
 - trees may be poorly accessible
- **transfer of PPP data to OPM control would bear a high level of uncertainty!**

Project Organisation

– **project management**

- BAuA, unit 4.1 „Exposure Scenarios“

– **measurements and analysis**

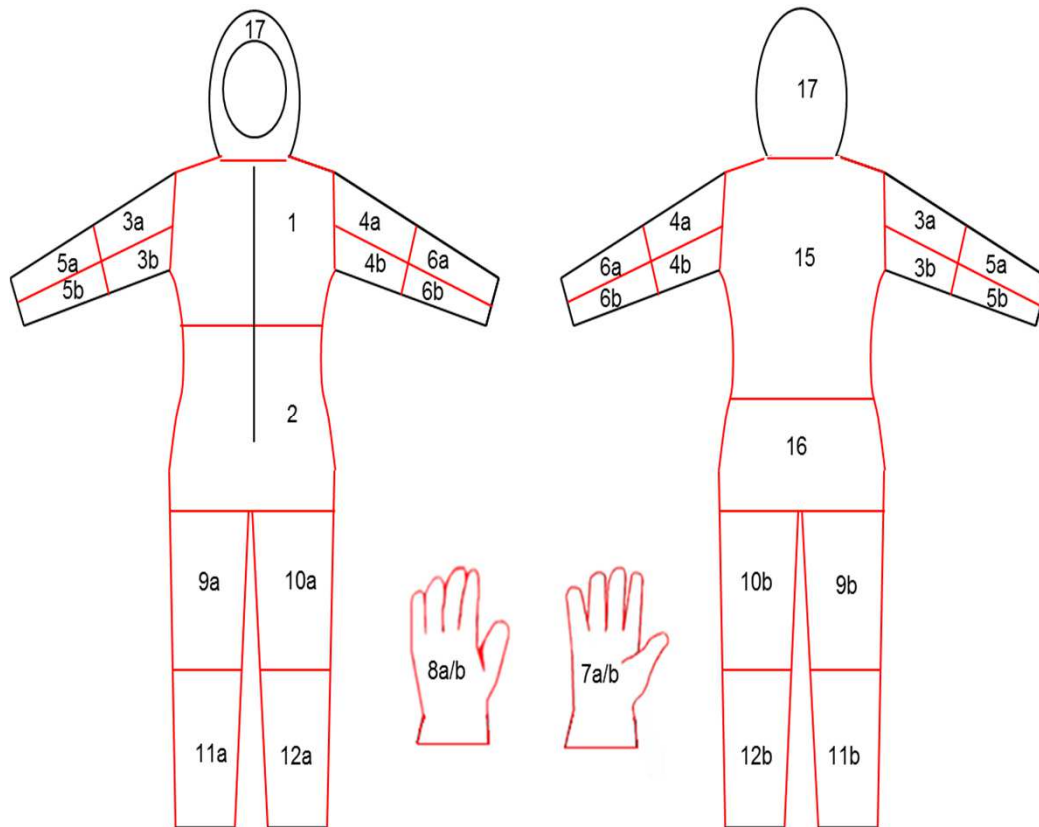
- inhalation exposure: BAuA, unit 4.4
“Measurement of Hazardous Substances“
- dermal exposure: IPASUM, University of Erlangen-Nuremberg
- field trials: April/May 2014 + 2015

Sampling Strategy: Inhalation



photos: BAuA

Sampling Strategy: Dermal



picture: IPASUM



photo: BAUA

Results: Vehicle-mounted Spraying Devices

exposure patterns during preparation of the application liquid

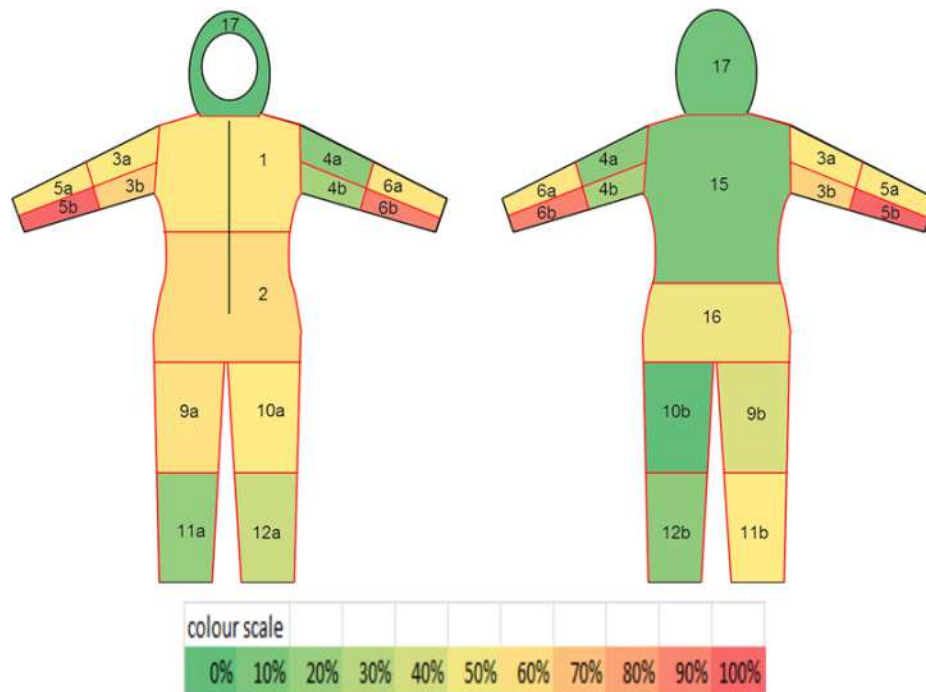


photo: BAuA

Results: Hand-held Spraying Devices

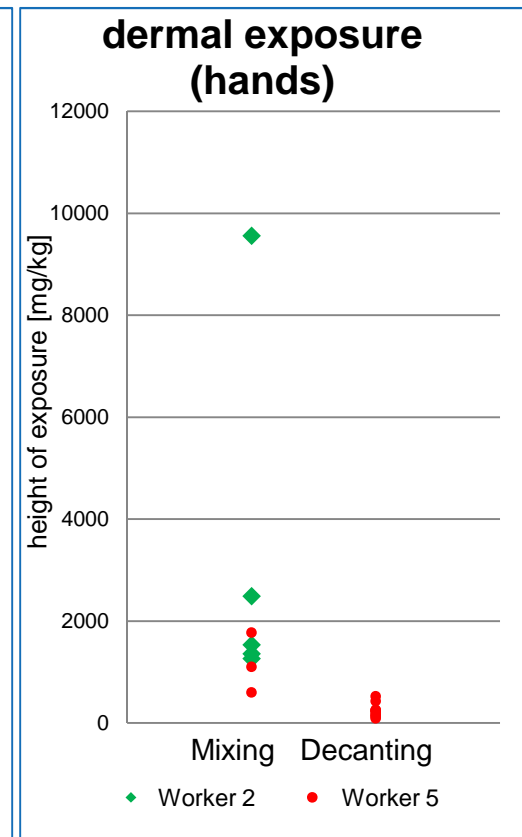
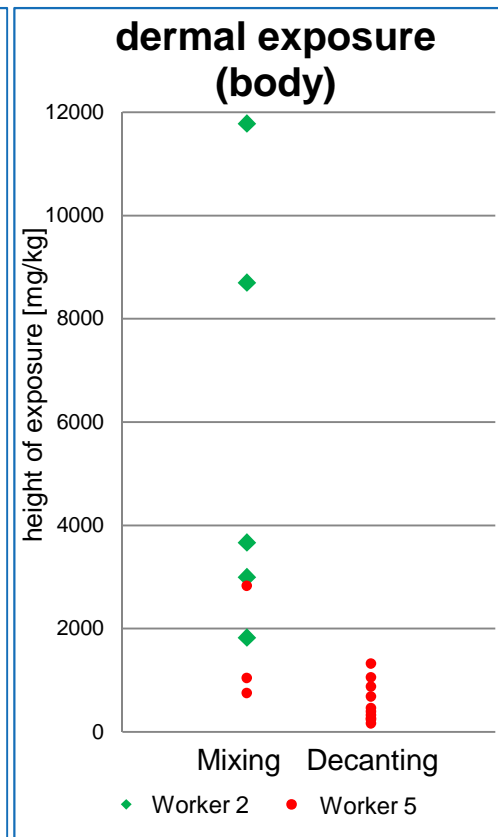
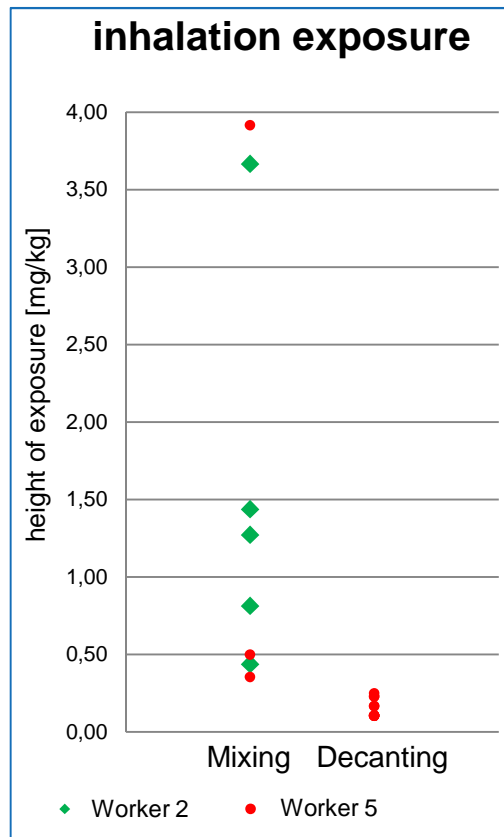
comparison: mixing application liquid vs decanting from the tank (presented data include application!)



Mixing



Decanting



Results: Hand-held Spraying Devices

exposure patterns resulting from hand-held spraying

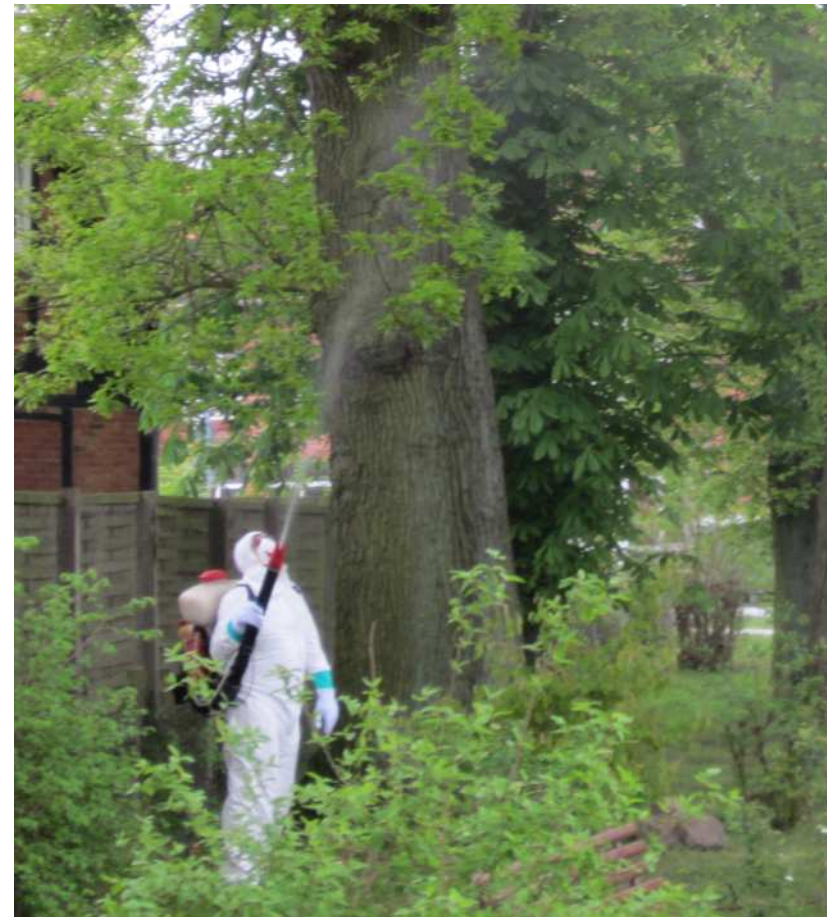
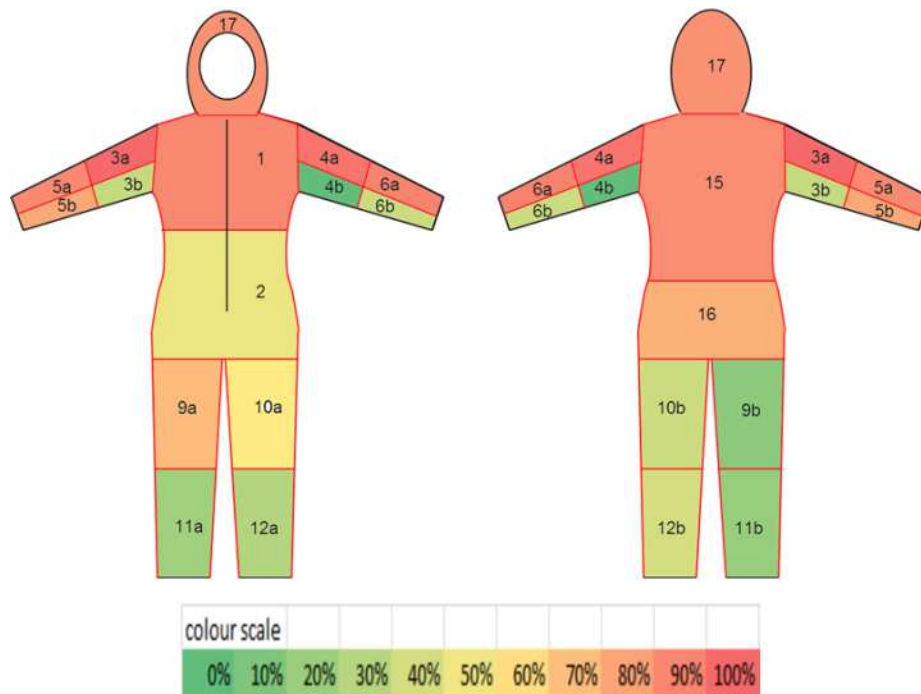
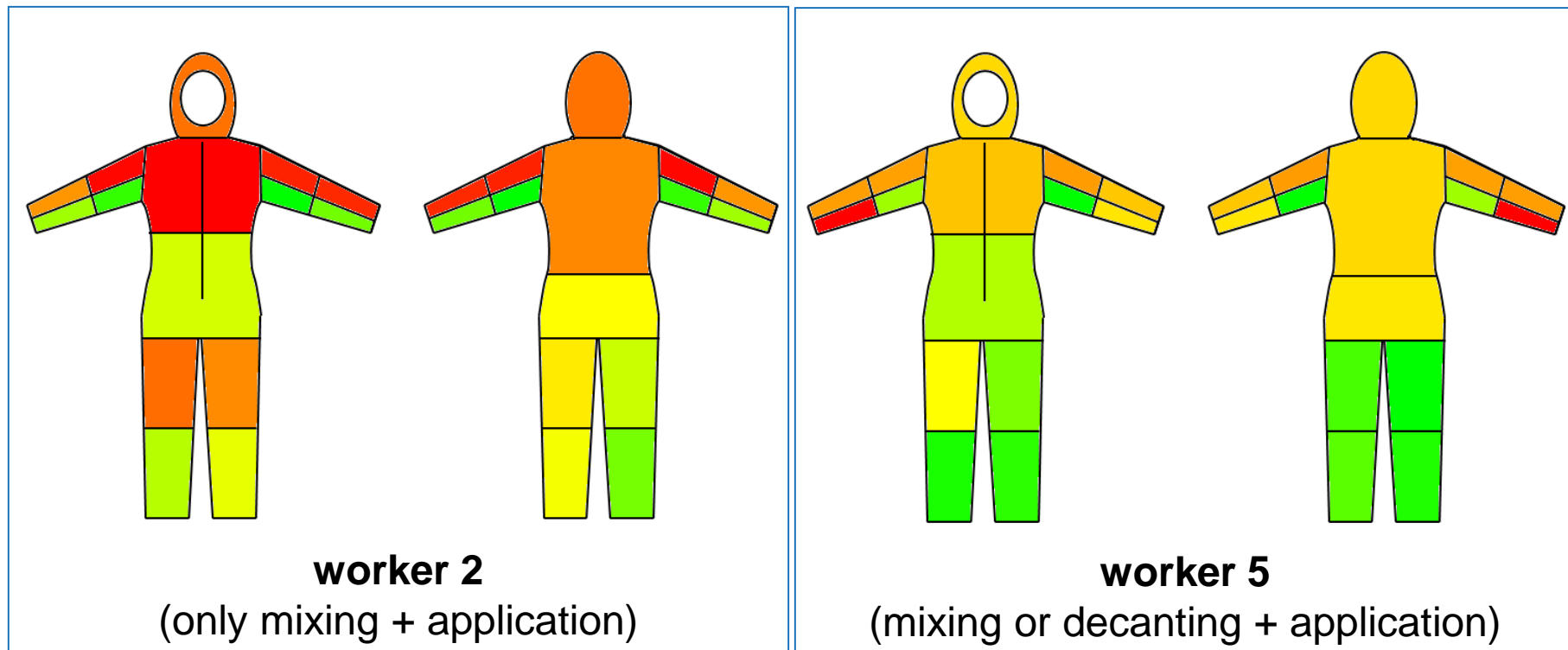


photo: BAuA

Results: Hand-held Spraying Devices

exposure patterns resulting from hand-held spraying:
personal behaviour

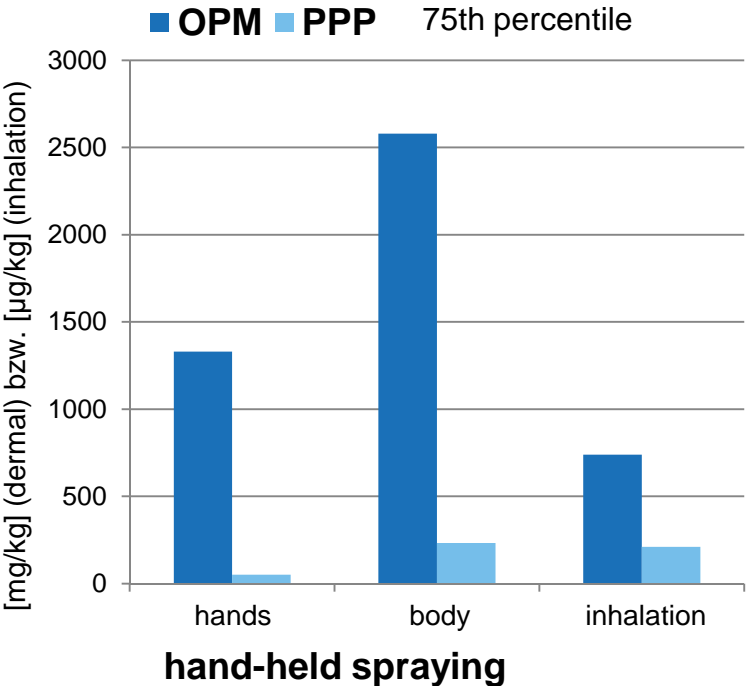


pictures: IPASUM

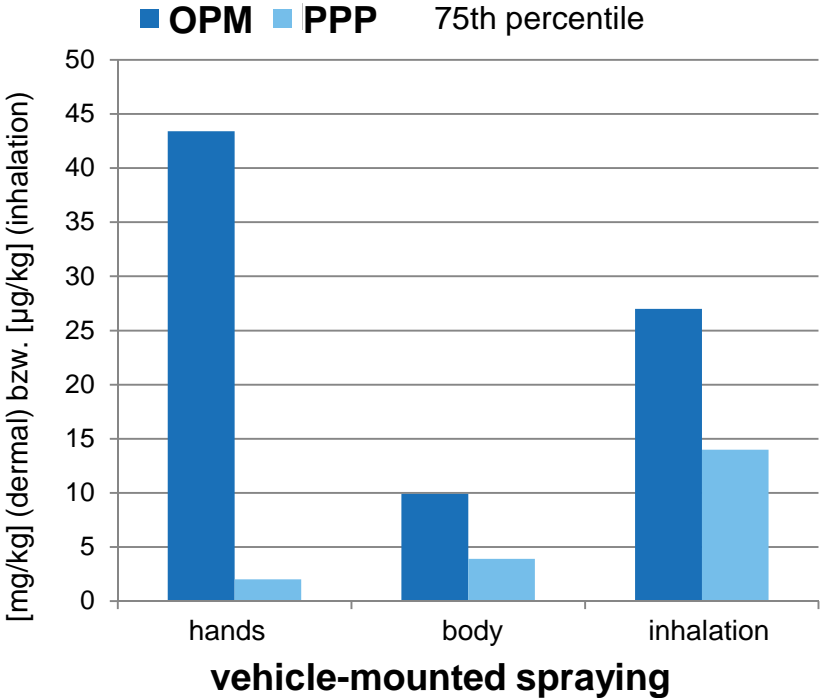
Comparison Between OPM Control and PPP Models

- comparison with data from AOEM:*

- hand-held spraying
 - M&L: knapsack all
 - App: HCHH all



- vehicle-mounted spraying
 - M&L: ML tank WG
 - App: HCTM cabin



* Joint development of a new Agricultural Operator Exposure Model - Project Report. Federal Institute for Risk Assessment (BfR), 2013

Summary

- **control of OPM to prevent human health: Biocides-Regulation**
- **products must be authorized for Control of OPM**
- **project F 2343: data on inhalation and dermal exposure for assessment of biocides**
 - vehicle-mounted spraying
 - hand-held spraying
- **results:**
 - mixing and loading phase contribute significantly to the overall exposure
 - exposure depends significantly on different approaches and personal behaviour
 - major differences to exposure seen in PPP applications

Thank You for Your Attention!

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