Overview of Worker Risk Assessments

PPDC Meeting
November 30, 2000

We consider those who apply… handlers

Handlers Include…

- Agricultural uses
- Nursery and landscape
- Structural pest control
- Uses on animals
- Public health
- Forestry
- Lawncare and golf courses

We also consider field workers… reentry

Reentry includes…

- Harvesting activities
- Golf course workers
- Nurseries and floriculture
- Other agricultural activities

  e.g., irrigation, thinning, tying

How do we assess occupational risks?

- Types of data used
- Handler exposures
- Reentry exposures
- The future

Types of Data: Exposure

- Guidelines (875 Group A and B)
- Dermal
  - Patches or long underwear
  - Hand and face/neck rinses
- Inhalation
- Dislodgeable Foliar Residue (DFR) (what can rub off on skin over time)
- Biological monitoring

Types of Data: Examples of Partnerships

- Other agencies (e.g., USDA & HHS)
- Registrant task forces (e.g., ARTF)
- Grower groups & associations
- Public interest groups

Types of Data: Use/Usage & Practices

- Example Sources
  - Government & industry surveys
  - Extension services
  - Stakeholders
  - Manufacturer literature & trade press
  - Product labels
- Consider typical & allowable uses
- Science policy paper (http://www.epa.gov/oppfead1/trac/science/#additional)

Handler Exposure: Equation

$$\text{Exposure} = \frac{\text{Unit Exposure} \times \text{Acres} \times \text{Rate}}{\text{Body Weight}}$$

Unit exposures are real data from measured workers that depend on:

- Type of product (e.g., dusts or liquids)
- How applied (e.g., airblast, groundboom)
- Protective equipment (e.g., gloves, tractor cabs)

Active ingredient is not the key driver

Handler Exposure: Data Sources

- Data for each chemical
- We rely on PHED (Pesticide Handlers Exposure Database), measured exposure data

Handler Exposure: PHED Developed By…

- The U.S. Environmental Protection Agency
- Health Canada
- CA Department of Pesticide Regulation
- Pesticide Industry (American Crop Protection Association)
- New initiative to upgrade

Handler Exposure: What Is PHED?

- Database containing measured handler exposure data
- Provides different exposures based on protection used, how applied, and type of product – these are called scenarios

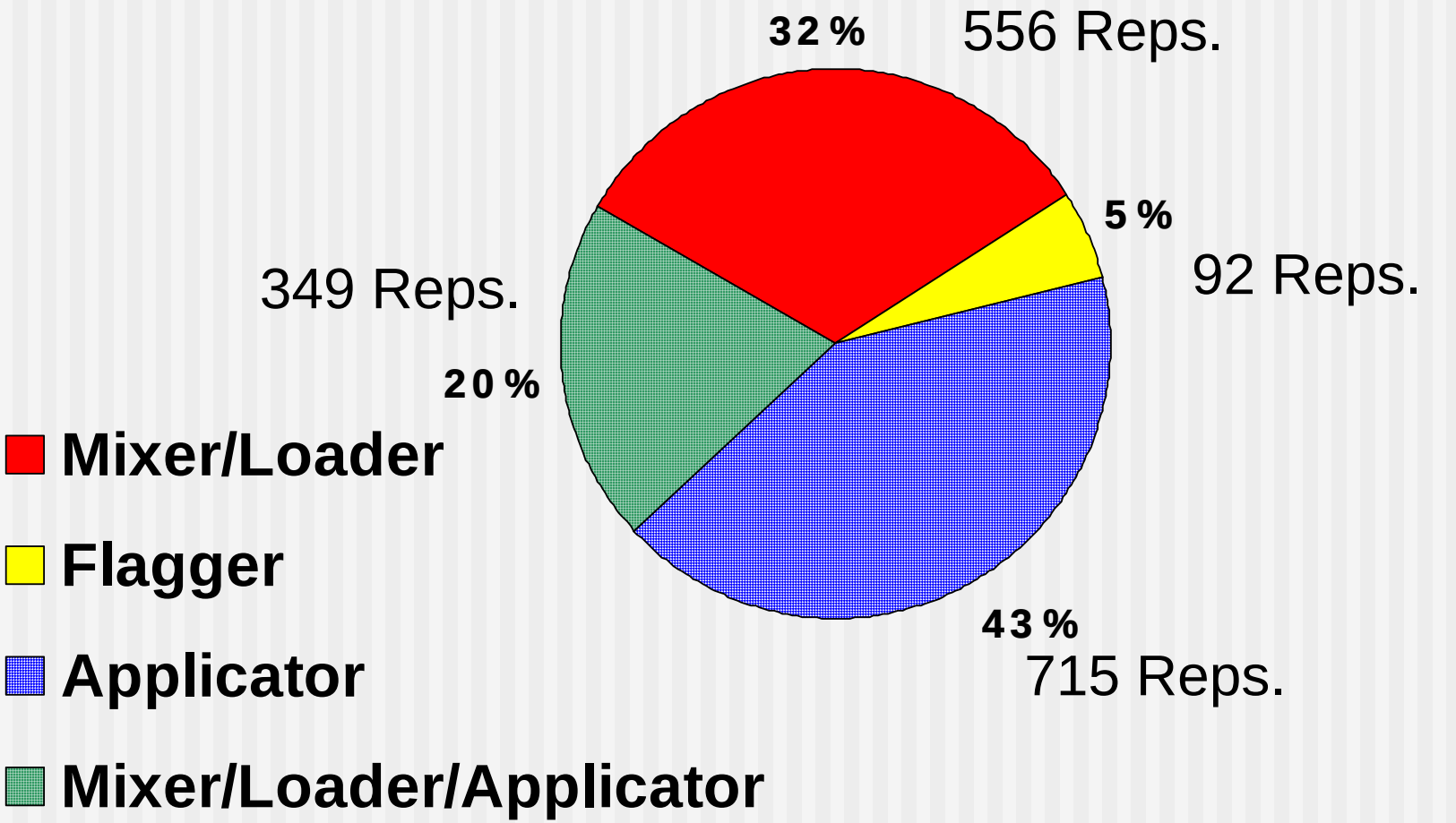
Handler Exposure: PHED Airblast Scenario

- Long pants, long-sleeved shirt, open cab
  (0.36 mg/lb ai)
- w/closed cab
  (0.019 mg/lb ai)
- All data are measured

Handler Exposure: PHED Groundboom Scenario

- Long pants, long-sleeved shirt, open cab
  (0.014 mg/lb ai)
- w/closed cab
  (0.005 mg/lb ai)
- All data are measured

Handler Exposure: Distribution of PHED Data



PHED Improvements

- Better Use of Data
- Expand & Strengthen (e.g., high acreage)
- Measurement methods

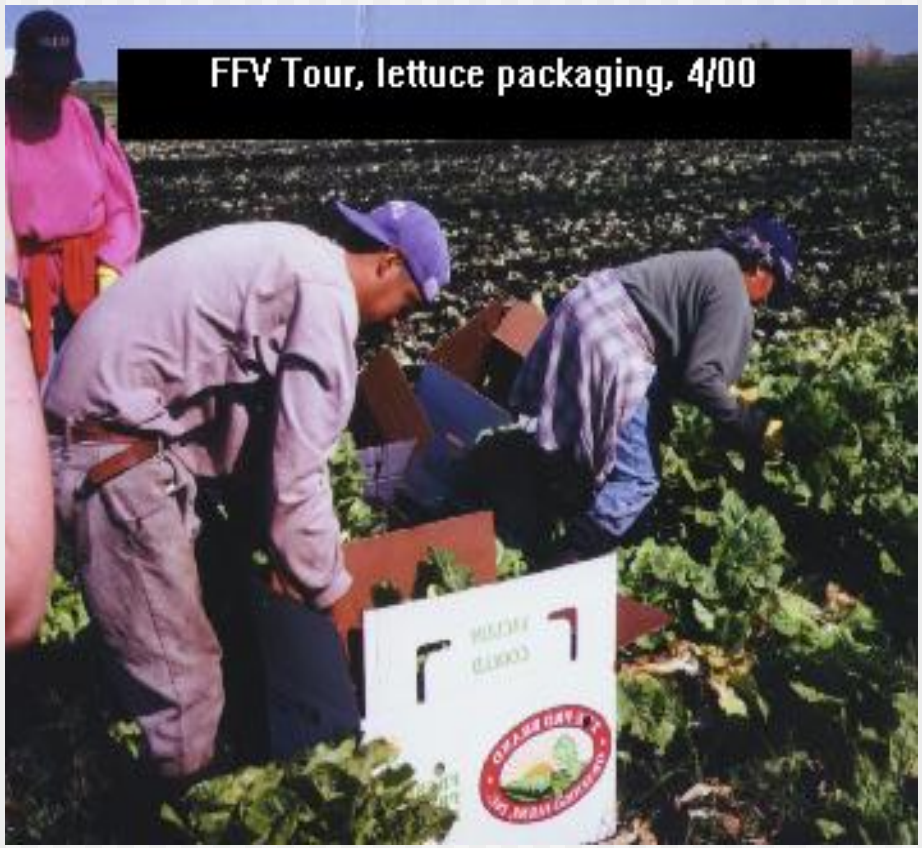
Post-application Assessments

$$\text{Exposure} = \frac{\text{DFR} \times \text{TC} \times \text{Hours Worked per Day}}{\text{Body Weight}}$$

- Fieldworker exposure depends on:
  - DFR (dislodgeable foliar residue) -- what can rub off on your skin
  - TC (transfer coefficient) -- amount of contact with plant, different for crops and activities
- Basis for REIs (Restricted Entry Intervals)

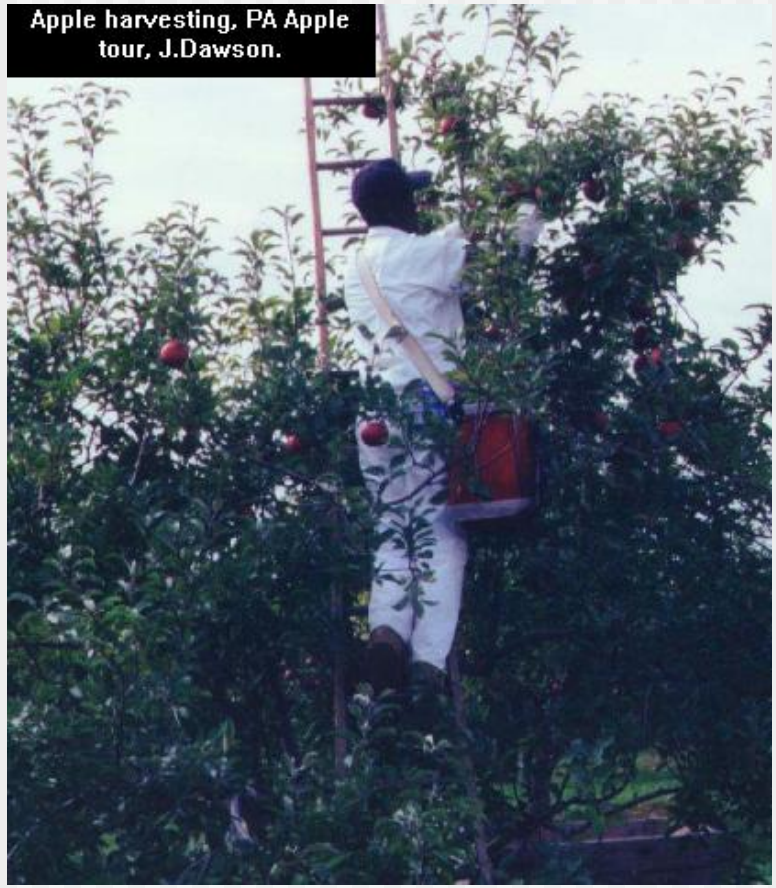
Reentry Exposure: Lettuce Harvesting Example

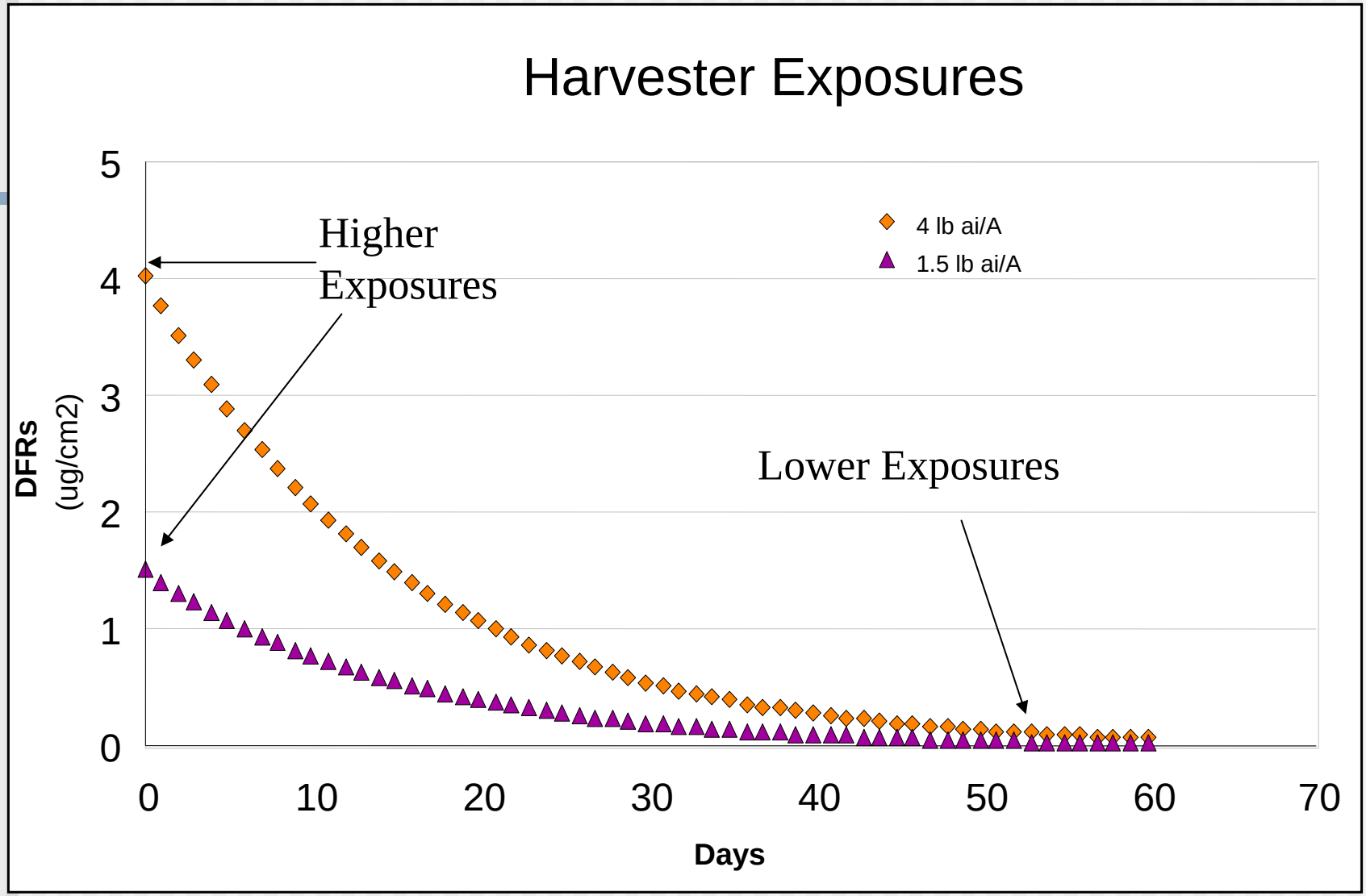
- TC is for harvesting leafy vegetables (e.g., collards & kale)
- TC = 2500 cm^2/hr



Reentry Exposure: Apple Harvesting Example

- TC is for harvesting tree fruit (e.g., pears & peaches)
- TC = 3000 cm^2/hr




Harvester Exposures
Higher Exposures
Lower Exposures
4 lb ai/A
1.5 lb ai/A
DFRs (ug/cm2)
Days
0
1
2
3
4
5
0
10
20
30
40
50
60
70

Use of New ARTF Data:

- New TC data (looks at a large variety of tasks and crops)
- 96 crops surveyed
- 16 regions
- These data are currently being used for risk assessments including the organophosphates
- Sorted based on types of work and shape/size of crop

Moving Forward…

- Use ARTF data as it arrives and is reviewed
- Complete work with industry to upgrade PHED
- Collect more exposure & use information
- Include research results (e.g., NIOSH Sensor, Ag Health Study, studies with farmworker children)

Final Thoughts…

- We produce high quality risk assessments.
- We believe in constant improvement
  - Changing to reflect changing agricultural and pest control uses
  - Improvements in risk science
- Build upon long history of partnerships

Thank You