

Pesticide Take-Home Pathway Interventions



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Take-Home Pesticide Exposure in Agricultural Communities

- } Workplace-to-residence transmission of hazardous chemicals well documented for other industries
- } NIOSH 1995 Report to Congress on Workers' Home Contamination Study
- } Exposure pathways not well-defined
- } Agricultural workplace limited study

Childhood Pesticide Exposure Pathways

- } Diet
 - } Drinking water
 - } Residential use
-
- } Proximity
 - } Take-Home



Washington Orchards



Target Pesticides

- } Azinphosmethyl
(Guthion™)
- } Phosmet
(Imidan™)
- } Chlorpyrifos
(Lorsban™)
- } Ethyl Parathion



Agricultural Families and organophosphate (OP) pesticides

- } Residues in yard soil and house dust significantly higher. (*Simcox et al., 1995*)
- } Metabolites in urine higher in children. (*Loewenherz et al., 1997*)
- } Residues in house dust and vehicle dust of agricultural workers were significantly correlated. (*Curl et al., 2002*).
- } Metabolites for agricultural workers and their children were significantly correlated. (*Curl et al., 2002*).

Workplace Determinants of Take Home Pesticide Exposure

- Better characterize exposure pathways
- Focus on breaking the exposure pathways closer to source
- Identify practical, cost-effective interventions

-
- 2003 Baseline study
 - 2004 Intervention study

Methods

Baseline and intervention studies:

- Structured interviews
- Vehicle dust and house dust sampling with analysis for OP pesticides
- Walkthrough observations and checklist

Intervention study:

- Wipe samples with analysis for OP pesticides
- Exposure assessment

Interviews



Vehicle Dust



House Dust



Wipe Sample

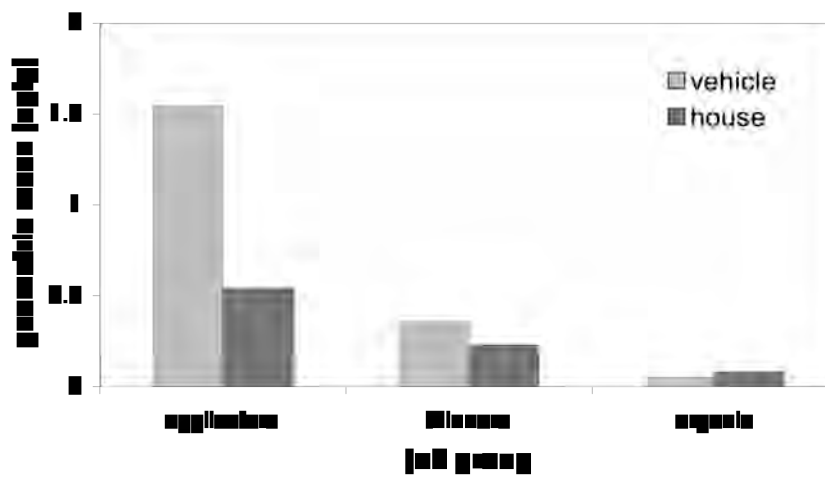


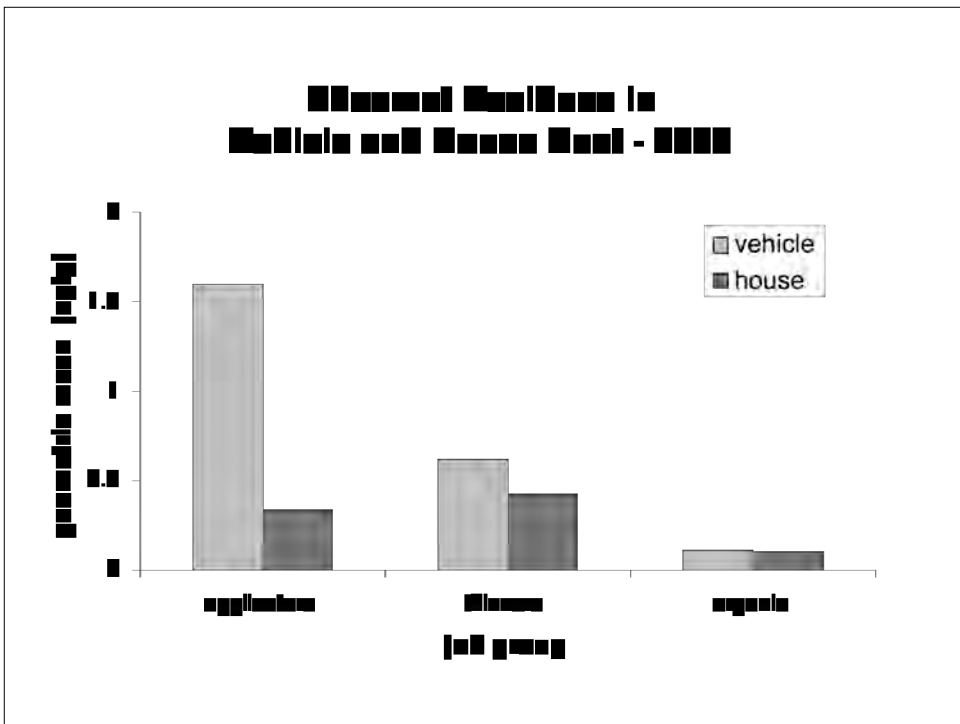
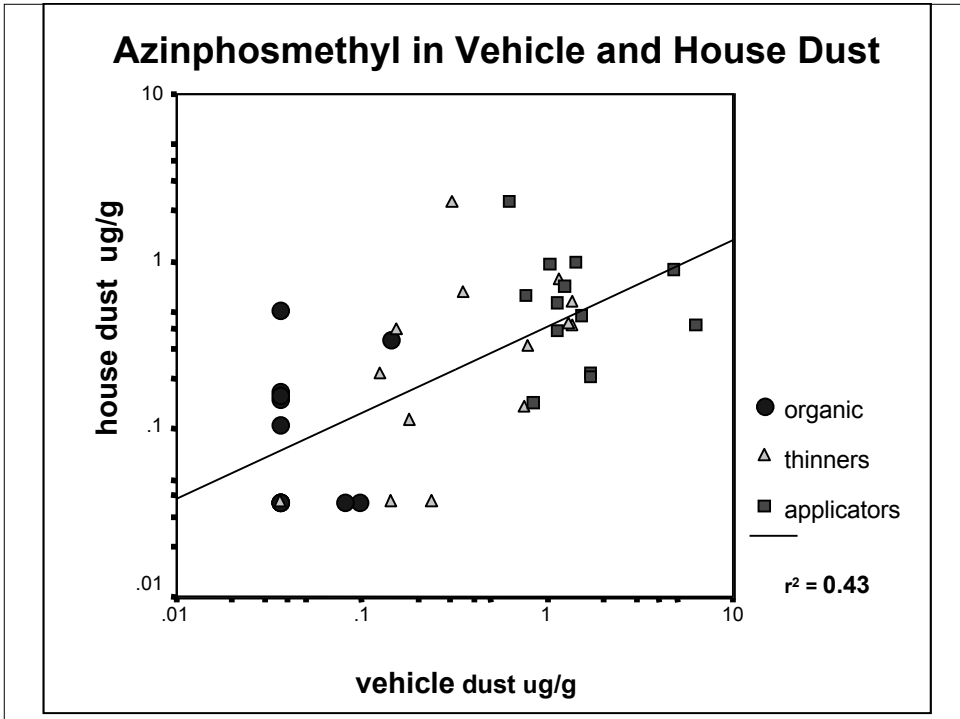
Baseline Study 2003

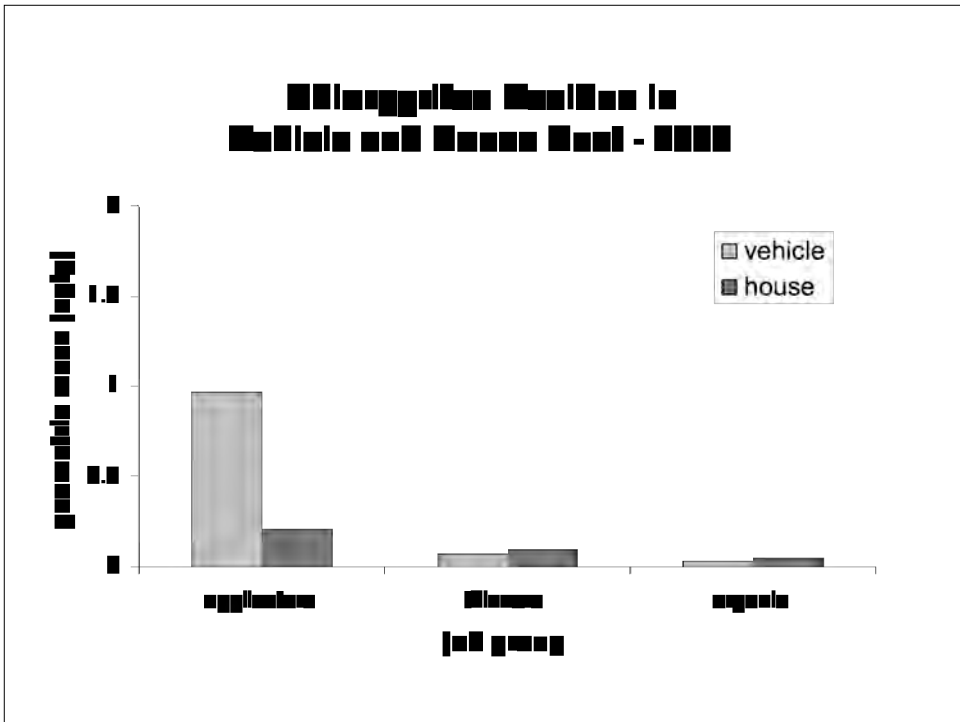
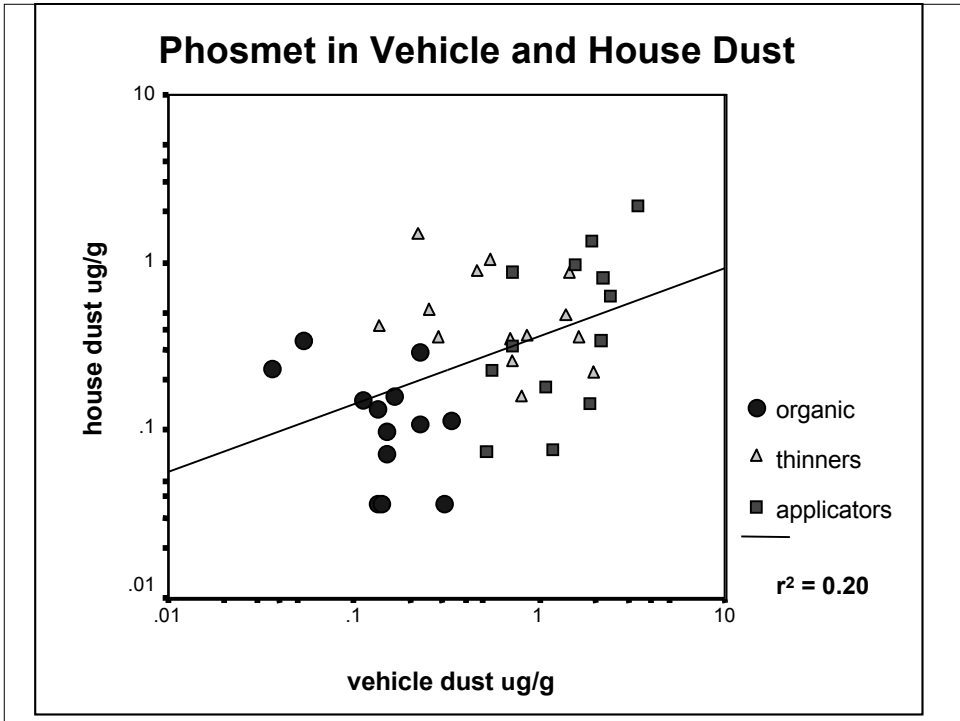
| Group | Orchard | Number |
|-------------|--------------|--------|
| Applicators | Conventional | 16 |
| Thinners | Conventional | 15 |
| Farmworkers | Organic | 13 |

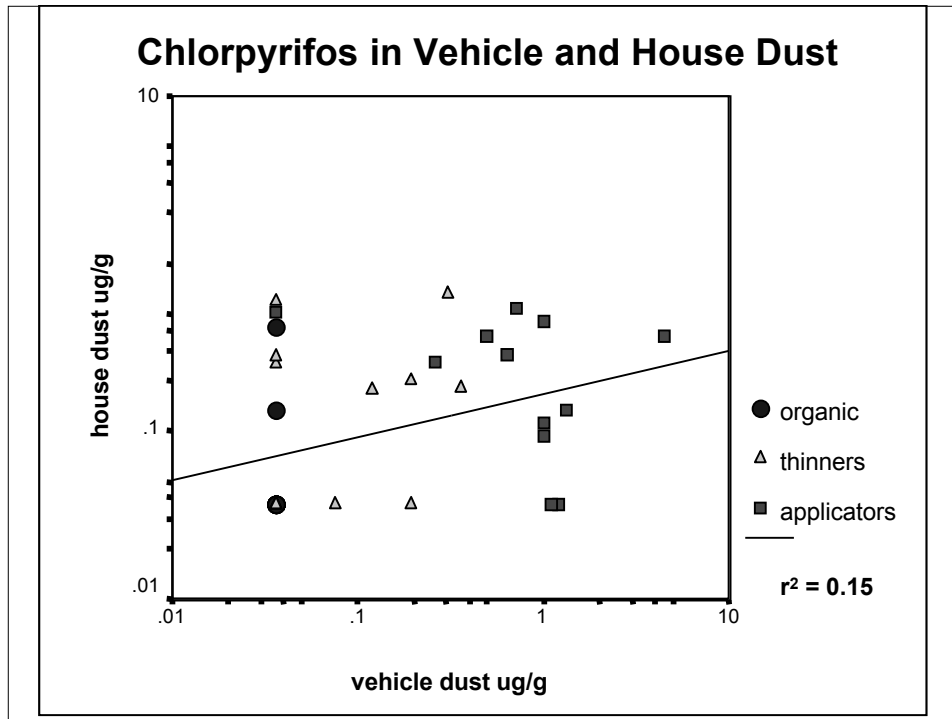
9 interviews foremen/managers from both orchards

Employment Conditions in Vehicle and House Work









Workplace Conditions

} Applicators

- drive personal vehicles to shop, not orchard
- have a personal locker for both work clothes and PPE
- have hygiene facilities in field and shop

} Thinners

- drive personal vehicles to work locations in the orchard
- have no locker room
- have hygienic facilities in the field only

Store Work Clothes and Boots

| | % | | | |
|--------------|------------|---------|---------|---------|
| | Applicator | | Thinner | |
| | boots | clothes | boots | clothes |
| In home | 44 | 56 | 67 | 100 |
| Outside home | 25 | 19 | 27 | 0 |
| In car | 0 | 0 | 7 | 0 |
| At work | 31 | 25 | 0 | 0 |

Work Clothes and Boots at Home

| | % yes | |
|--|-------------|----------|
| | Applicators | Thinners |
| <hr/> | | |
| Usually wear into the house after work | | |
| -Work boots | 69 | 87 |
| -Work clothes | 75 | 93 |
| Washer and dryer at home | 12 | 47 |

2003 Baseline Study Conclusions

- Azinphosmethyl vehicle and house dust results provide additional support for the vehicle as a vector
- Work clothes and boots are sources of pesticide residue in the home
- Traditional clothes washing recommendations not practical
- Exposure information needed

Intervention Study 2004

- Eliminate/reduce pesticide use
- Closer to the source
- Feasible
- Practical
- Acceptable to employees
- Acceptable to employer

Interventions

- } Applicators
 - Locker room housekeeping
 - Control: 2003 applicators
- } Thinners
 - Personal car vacuuming
 - boot bin
 - Control - no intervention

Locker Room Housekeeping - Applicators -

- } Pre-application spring cleaning
- } Daily housekeeping
- } Boot cleaning before entry
- } Leave for home directly from locker room at the end of the day
- } Signage
- } Training
- }
} Separate lockers for PPE and work clothes

Personal Car Vacuuming -- Thinners

- } Located at an employer facility
- } Convenient location on the way to home



Personal Car Vacuuming -- Thinners

- } Vacuum vehicle once a week
- } Instructions
- } Follow-up phone call



Portable Boot Bin -- Thinners

- } Portable boot bin
- } Labels



Portable Boot Bin -- Thinners

- } Instructions



Portable Boot Bin -- Thinners

} Sandals



Evaluation

| | Applicators | | Thinners | |
|---------------------|--------------|--------|----------|---------|
| | Housekeeping | Vacuum | Boot bin | Control |
| Interview | X | X | X | X |
| House dust | X | X | X | X |
| Vehicle dust | X | X | X | X |
| Wipe sample | X | | X | |
| Walkthrough | X | | | |
| Exposure assessment | X | X | X | X |

Next Steps

- Minimize/eliminate pesticide use
- Orchard/farming practices
- Community/regional interventions

Contributors and Support

- Rich Fenske
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Orchard Airblast Spraying

