Improving the work life of workers in the winegrape harvesting industry through PtD

In partnership with the National Institute for Occupational Safety and Health
AgSafe Mission and Goal

**Mission:**
To minimize injuries, illness and fatalities in California’s agricultural industry.

**Goal:**
To provide employers the tools they need to keep employees safe and healthy while running profitable, successful businesses.
AgSafe Scope of Work

Education
Training
Industry Outreach
Resource Development
Research
Initiated with the California Vineyard Ergonomics Partnership Project

- Winegrape Growing Industry
- Napa and Sonoma Counties
- Spanned 1997-2000
- Funded by NIOSH under the Community Partners for Health Farming Program
- Conducted by the University of California, Agricultural Ergonomics Research Center

John Miles  James Meyers  Ed Weber  Diana Tejeda
Julia Faucett  Linda Garcia  Michael Tarter  Victor Duraj
Ira Janowitz  Rhonda Smith  Florence Morrison  Sally Suriano
Project Background

- **Participating organizations**
  - 3 wineries; 1 winegrape vineyard management
  - Mid-size firms
  - Non-union

- **Participating workers**
  - 200 permanent employees; vineyard jobs only
  - Majority Spanish speaking; Mexico national origin
  - $8-10 per hour; piece work
Project Background

Project included:

• Health record review

• Ergonomic analysis of the workers and jobs performed
  • Including farm worker input on core issues and suggestions for solutions

• Identification of viable solution – new wine grape harvesting bin
Health Record Review

- 30 months of records review
- 194 workers at 3 vineyard companies
- 29 MSDs defined for 28 workers
- 435 lost workdays
- 69% were back injuries
- From "lifting during harvest"

Ergonomic Risk Factors

- Bending forward up to 90° for long periods
- Lifting and carrying 20 tubs per hour, at 57 pounds
- Contact stresses on hands from tub handles
- High metabolic demands:
  - Average working heart rate of 125 beats per minute
  - Average energy expenditure of 47.7% aerobic capacity
Winegrape Hand Harvesting Actions

- Stoop
- Reach
- Repetitive hand cutting
- Lift load
- Carry load
- Slide load
Winegrape Hand Harvesting Actions

- Stoop
- Reach
- Repetitive hand cutting
Winegrape Hand Harvesting Actions

Lift load
Winegrape Hand Harvesting Actions

Carry load
Winegrape Hand Harvesting Actions

Slide load
Winegrape Hand Harvesting Actions

The Solution
The Solution
The Solution
California’s Wine Industry Circa 2000s

- CA accounts for over 90% of US wine production
- Agriculture total value over $2.3 billion
- Estimated 531,000 acres in wine grapes
- 3.58 million tons of wine grapes
- Over 4,600 wine grape growers in CA
- CA wine industry employs over 330,000 workers annually and $12.3 billion in wages
# Prevention through Design

## 10 Years Later

- **Winegrape Growing Industry**
- **Napa and Sonoma Counties**
- **Reviewing diffusion from 2000-2010**
- **Funded by NIOSH Intramural Prevention through Design Program**

**NIOSH Team Members:**
- Elyce Biddle
- Mike Gressel
- John Sheehy
Project Components

• Partner planning meeting

• AgSafe survey – 10 years later
  • AgSafe, Agricultural Safety Resource Alliance (ASRA), and Wine Industry Officers of Safety (WINOS)
  • Distributed link via email and mailed complete survey to owners/managers

• Focus groups – owners and farm workers

• Interviews – owners and farm workers
Survey Results

Tub Usage

- Smaller Tub: 45%
- Larger Tub: 30%
- Other: 15%
- Unknown: 11%
## Survey Results

### When did your company begin providing the smaller tub?

<table>
<thead>
<tr>
<th>Duration</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 2 years</td>
<td>25.0%</td>
</tr>
<tr>
<td>3-5 years</td>
<td>30.0%</td>
</tr>
<tr>
<td>6-10 years</td>
<td>30.0%</td>
</tr>
<tr>
<td>More than 10 years</td>
<td>15.0%</td>
</tr>
</tbody>
</table>

### How soon after you heard about the smaller tub did you begin providing them?

<table>
<thead>
<tr>
<th>Duration</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>The next harvest season</td>
<td>85.0%</td>
</tr>
<tr>
<td>2-3 years</td>
<td>15.0%</td>
</tr>
<tr>
<td>More than 3 years</td>
<td>0.0%</td>
</tr>
</tbody>
</table>
Survey Results

Why did you begin providing the smaller tub?

- Increased productivity: 5%
- Safer for employees: 81%
- Other: 14%
If the smaller tub is not currently being used to harvest grapes, why not?

<table>
<thead>
<tr>
<th>Reason</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Too expensive</td>
<td>0.0%</td>
</tr>
<tr>
<td>Permanent employees do not like them</td>
<td>14.3%</td>
</tr>
<tr>
<td>Didn’t know about smaller tub</td>
<td>0.0%</td>
</tr>
<tr>
<td>Don’t know where to purchase smaller tub</td>
<td>0.0%</td>
</tr>
<tr>
<td>Don’t know</td>
<td>0.0%</td>
</tr>
<tr>
<td>Other</td>
<td>85.7%</td>
</tr>
</tbody>
</table>

- Have smaller 30 pound tubs
- Use other tubs
- Have to buy all new tubs
- Already have larger tub
- The bigger tub fits more
- Tub is too deep and employees tend to put more grapes than our 35# max
Survey Results

Why are you going to continue providing the smaller tub?

<table>
<thead>
<tr>
<th>Reason</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employees/laborers prefer</td>
<td>27.8%</td>
</tr>
<tr>
<td>Good productivity</td>
<td>5.6%</td>
</tr>
<tr>
<td>Safer than larger tubs</td>
<td>61.1%</td>
</tr>
<tr>
<td>Other reason</td>
<td>5.6%</td>
</tr>
</tbody>
</table>
## Focus Group Feedback

**Why have the tubs been used?**

<table>
<thead>
<tr>
<th>Motivators</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less prep work</td>
<td>Lighter weight</td>
</tr>
<tr>
<td>Fewer injuries</td>
<td>Less tired after work</td>
</tr>
<tr>
<td>Fewer aches and pain</td>
<td>Makes workers happy</td>
</tr>
<tr>
<td>Easy to find</td>
<td>Other workers use</td>
</tr>
<tr>
<td>Easy to use</td>
<td></td>
</tr>
</tbody>
</table>
### Focus Group Feedback

**Why have the tubs not been used?**

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Too expensive</td>
<td>Better tubs in market</td>
</tr>
<tr>
<td>Tub less sturdy</td>
<td>More walking required</td>
</tr>
<tr>
<td>Grips not comfortable</td>
<td>Wear out quicker</td>
</tr>
<tr>
<td>Need to overfill to make $</td>
<td>Don’t use tubs</td>
</tr>
<tr>
<td>Not full time business</td>
<td></td>
</tr>
</tbody>
</table>
Project Observations

From Focus Groups and Interviews, determined that PtD diffusion:

• Occurred with both owners/managers and farm workers
• Continues today
• Through:
  • Word of mouth
  • Safety trainings
  • Outreach – AgSafe, ASRA, WINOS
Project Observations

- Continued use of PtD was driven by demand from labor
- Modifications for improved use of PtD developed by labor
- Employee satisfaction and morale integral in management decision-making paradigm
The Future

Tub Improvement

Focus group and survey feedback:

PVC pipe handle modifications

Tub manufacturer buy-in?
The Future

Other Industry (Commodity) Use
- Olives
- Table Grapes
- Raisin Grapes