



UTHealth

The University of Texas
Health Science Center at Tyler

Reforestation Worksite Assessment in the Ark-La-Tex

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Background

- The southeastern United States is known as the ‘wood basket’ of the nation, producing the majority of wood fiber in the country;
- The Ark-La-Tex region is a major force in timber production;

The results presented here are part of an exploratory study of manual and machine tree planters:

Data collection to date consists of in-depth interviews, a field-based exposure assessment, and a field based exposure assessment of postures, movements, exertions and physical activity. This study is the first to assess the burden of illness and injury in machine tree planters.

Reforestation

- Tree planting, herbicide application, brush clearing
- Most workers from Mexico, Guatemala, Honduras, Brazil – more recently from Ghana; mostly males
- Interviewed workers ranging in age from 18 to 64 years
- Work is inherently mobile, year-round (planting in winter months)
- Speed is critical – piece rate is the unofficial form of payment
- An uptick in mechanized planting in Texas

Specific Aims

- Aim 1: Delineate health and safety risk factors associated with tree planting;
- Aim 2: Develop a draft of an exposure assessment instrument for use with tree planters;
- Aim 3: Establish the feasibility of collecting quantitative data from forestry services workers on their occupational health risk factors, health outcomes.

Progress to Date

- 20 interviews with contractors/employers
- 5 interviews with mechanized tree planters
- 5 interviews with manual tree planters
- Direct observation, 2 mechanized planting crews
- WBV measurement, 2 crew teams
- Hand wipe sampling, 1 crew
- Noise measurement, 1 crew
- Developed exposure assessment tool

Open-Land Tree Planter







Wild-land Tree Planting









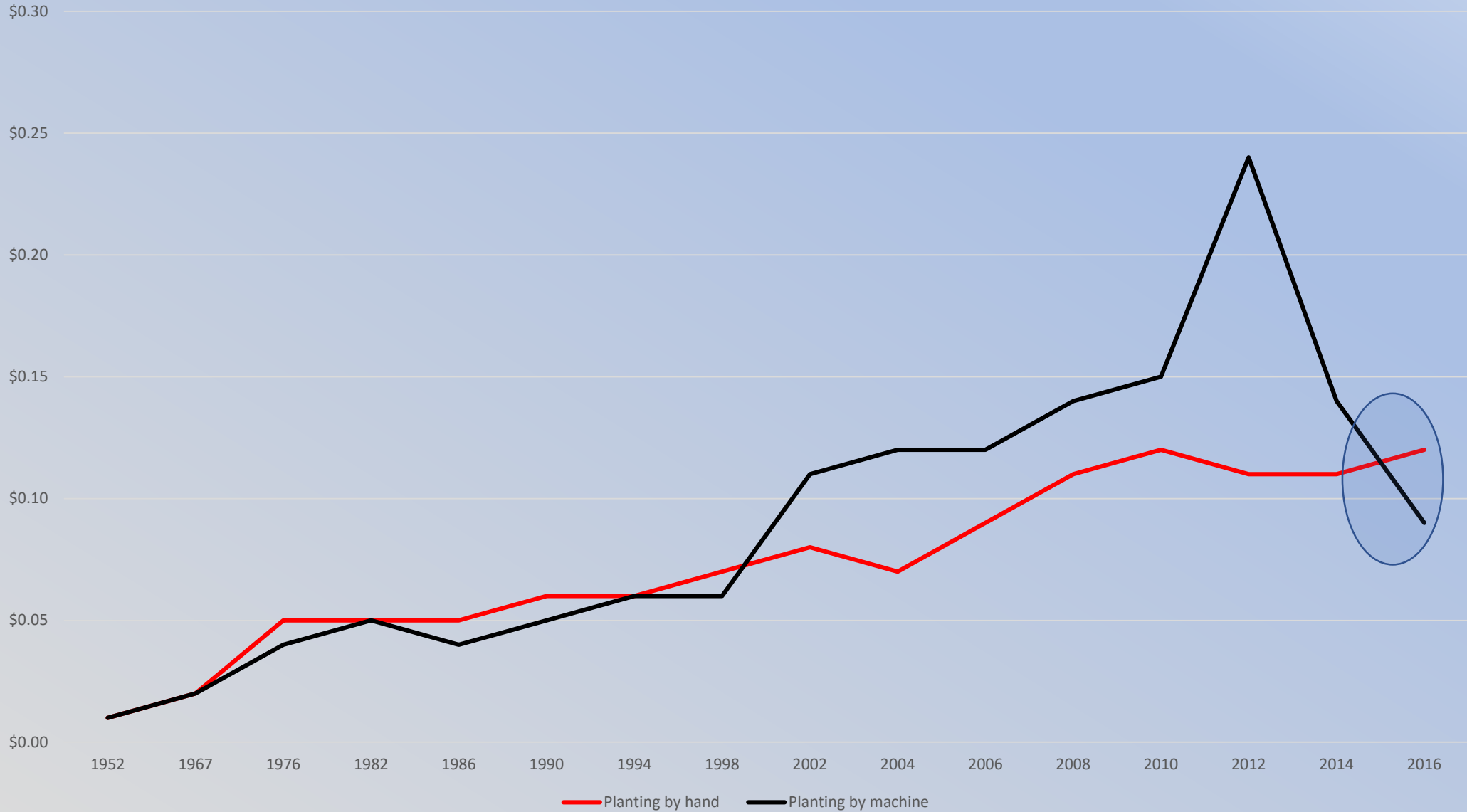
Manual Tree Planting



Mechanized Tree Planting is becoming more prevalent across the Ark-La-Tex for a number of reasons:

1. Consistent density and survivability
2. Larger tracts
3. Industrial timber producers
4. Decreasing costs

Tree planting costs per acre in the South 1952-2016



Source: Costs & Trends of Southern Forestry Practices, 2016
ACES. Maggard & Barlow

Workplace Hazards & Exposures

- Awkward posture and static sitting
- Herbicides/pesticides/fungicides
- Noise
- Dust
- Extremes in temperatures

Exposure to Whole Body Vibration

- Occupational exposure to WBV has been associated with:
 - increased risk of low back pain
 - sciatic pain
 - degenerative changes to spinal system
- In the U.S., standards are available for reference, however, no specific regulations (such as the Code of Federal Regulations) mandate WBV identification, monitoring and control.
- Southern timber production, particularly logging, is highly mechanized making WBV an area of concern in this workgroup



Methods

- Three hours of tree planting were measured with two teams of wildland tree planters (dozer operator/planter operator) in northeast Texas in April 2018;
- Vibration was measured at the seat/operator interface with a triaxial seat pad accelerometer placed on dozer and planter seats;
- Linear accelerations were measured in the X-, Y-, and Z-axes;
- Surveys to assess musculoskeletal complaints were administered at shift-end.

Results

- High levels of vibration exceeding recommended vibratory dose values for dozer and planter operators.
- High amplitude mechanical shocks were also measured in the planter wagon.
- Survey responses at shift-end reveal some knee pain and leg pain.

	Dozer	Planter
Number of measures (N)	1	
Duration of measure (min)	126.3	122.2
Weighted RMS (m/s ²)		
Aw,x	0.67	0.68
Aw,y	0.45	0.50
Aw,z	0.79	1.19
Aw,total	1.37	1.18
A(8)	0.48	1.68
Time to A(8) AV (hrs)	2.25	0.28
Time to A(8) EL (hrs)	11.92	8.02
Crest factor (z axis)	12.05	87.21
VDV (m/s ^{1.75})		
VDVx	10.74	10.97
VDVy	6.95	8.45
VDVz	9.93	53.10
VDV(8)	20.99	74.15
Time to VDV(8) AV (hrs)	0.28	0.001
Time to VDV(8) EL (hrs)	8.02	0.05

Act Val .5 m/s²
Exp Limit 1.15 m/s²

Act Val 9.1m/s^{1.75}
Exp Limit 21 m/s^{1.75}



Conclusions

- As the cost for mechanized tree planting decreases, exposure to WBV will increase for this workgroup;
- Further assessment of WBV of machine tree planters (open land and wild land) is warranted before corrective actions can be undertaken.

Challenges for Outreach and Education

- Difficult to find
- Difficult to reach
- Access through employer difficult
- Economic pressure
- Physical and social isolation
- Time spent at each job site



Opportunities for Outreach and Education

- Use of social media and smart phones
- Many 'old-timers' in this workforce with many years of experience
- Both safety and health promotion training would be beneficial
- Emerging issues: Mesoamerican nephropathy; climate change; STDs/STIs; Zika

Acknowledgments

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- Nathan Fethke (Consultant, University of Iowa)
- David Douphrate (Co-Investigator, UTSPH San Antonio)
- Vijay Boggaram (UTHSCT)



Speaker Profiles

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Acknowledgements

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Western Agriculture Safety and Health Conference - *Cultivating Collaborations*

August 7-9, 2019

University of Washington campus, Seattle, WA

We would like to thank all participants in the 2019 Western Ag Safety and Health Conference. Our conference reached 170 attendees, and we could not have done it without you and our presenters, partners, and sponsors.

This event was a rare opportunity for those engaged in injury and illness prevention research in farming, fishing, and forestry. The western US shares a common history with these vital agricultural industries, landscapes, and communities. Likewise, we share common agricultural practices, workforces, and the means to improve conditions.

Cultivating Collaborations was co-sponsored by the five western NIOSH Agricultural Centers, the NIOSH Western States Division, and participation was invited from all partners in the implementation of science, service, and policy.

Our Theme

Cultivating Collaborations, reflects the conference goal to build collaborative relationships and foster the exchange of ideas. Attendees included academic researchers, students, and extension educators, and a broad range of research partners from community organizations, producers, health care providers, and

government agencies.

Conference Presentations & Program

KEYNOTE - Richard Fenske, [Beyond a Doubt: The critical role of science in workplace health and safety](#)

KEYNOTE - Marc Schenker, [Hired and Contract Ag Workforce - Sustainable Solutions](#)

Session I. [Hired and contract workforces](#)

Session II. [Prevention through design in new technologies](#)

Session III. [Climate change and health impacts](#)

Session IV. [Surveillance of AgFF injury, illness and economic impacts](#)

Session V. [Animal agriculture and the One Health approach](#)

Session VI. [Forestry safety innovations and populations](#)

Session VII. [Best practices in engagement](#)

Session VIII. [Commercial fishing and processing injury prevention](#)

PROGRAM MATERIALS

[Schedule](#)

[Thematic Sessions](#)

[Lightning Talks w/ viewable presentations](#)

[Poster Presentations w/ abstracts](#)

[Roundtable Discussion Topics](#)



WESTERN AG SAFETY & HEALTH CONFERENCE
Cultivating Collaborations
AUGUST 7 – 9, 2019

Seattle. University of Washington campus.
bit.ly/WestAgSafetyConf

A unique research conference addressing injury and illness prevention in Western farming, fishing, and forestry. Sessions focus on workforce safety and issues concerning: hired and contract workers, climate change, animal health, prevention through design, and research to practice.

This conference is co-sponsored by the five Western NIOSH Agricultural Centers, and the NIOSH Western States Division.

CONTACT

For questions, please email pnash@uw.edu or call (800) 330-0827.

SPEAKER PROFILES



Mental and Physical Health of Immigrant Workers in CAFOs and Field Ag
August 7, 2019 – Seattle, WA

Athena Ramos, PhD
Assistant Professor
Center for Reducing Health Disparities
University of Nebraska Medical Center

WESTERN AG SAFETY & HEALTH CONFERENCE
Cultivating Collaborations
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Athena Ramos, PhD

Mental and Physical Health of Immigrant Workers in CAFOs and Field Ag

PACIFIC NORTHWEST AGRICULTURAL SAFETY AND HEALTH CENTER

[MENU](#) 

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Forestry Safety Innovations and Populations



SESSION VI. Forestry – Integrating Safety in a Time of Rapid Change

Chair: Marcy Harrington, MPA, PNASH, University of Washington

There is an upswing in demand for forest products and land management that occupational health and forest management professionals need to be prepared to address. These trends are driven by the threat of wildfire and expanded demand for US timber. The forestry sector relies on a small and largely unskilled workforce in need for training, technology, and management solutions, especially in a time of rapid change. Currently transforming the West is a new logging technology - winch-assisted steep slope logging. This is opening up the West's steep slopes to harvesting and presents new safety challenges. In forestry services (forest maintenance), immigrant Latino workers conduct high hazard, intense manual labor tasks. This industry of small subcontractors is underserved and hidden from the regulatory eye and the workforce at high risk for injury and work abuses.

New Technologies Transforming Logging:

[Winch-assisted Machine Logging on Steep Slopes](#)

John Garland, PhD, PNASH, University of Washington

[Mechanized Planting in the Southwest](#)

Vanessa Cassanova, PhD, SW Ag Center, University of Texas at Tyler

[GPS and Location Services for Situational Awareness](#)

Rob Keefe, PhD, University of Idaho

Workforce Development Needs in the Forestry Sector:

NW Logger Needs Assessment and Coming Industry Initiatives

John Garland, PhD, PNASH, University of Washington

Mixed-methods Analysis of Logging Injuries in MT and ID

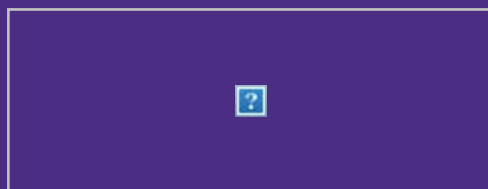
John Rosecrance, PhD, HICAH, Colorado State University

Logging Machine Operators, Health and Safety Training

Anabel Rodriguez, PhDc, SW Center for Ag Health, Injury Prevention and Education, University of Texas at Tyler

Panel: Immigrant Latino Workforces in Forestry Services

Carl Wilmsen, PhD, Executive Director, Norwest Forest Worker Center, Vanessa Casanova, PhD, SW Center for Ag Health, Injury Prevention and Education, University of Texas at Tyler Butch de Castro, PhD, PNASH, University of Washington



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