Ergonomic Risk Factors of Agricultural Jobs in Western Kentucky

Tyler Howell, Bayley Ranes | Faculty Mentor: Yousif Abulhassan, PhD, CSP, CPE

Department of Occupational Safety and Health, Murray State University

Introduction

- In 2019, an estimated 77.9 million pounds of burley tobacco was produced in Kentucky (USDA, 2020)
- The incidence rates of musculoskeletal disorders in support activities for crop production is 30.2 per 10,000 full-time workers (Bureau of Labor Statistics, 2019)
- The purpose of the study was to assess the ergonomic risk factors of cutting and spiking tobacco leaves during harvest

Methods

- Muscle activity and posture was assessed in the field during the cutting and spiking activities of tobacco harvesting

- **Research Subjects**
  - Nine (9) males
  - Mean Age (years): 30.7 (5.0)
  - Mean Body Mass Index (kg/m^2): 26.8 (4.4)

- **Data Collection Tools**
  - Inertial Measurement Units: thoracic flexion
  - Electromyography: muscle activity of the mid deltoid and trapezius muscles

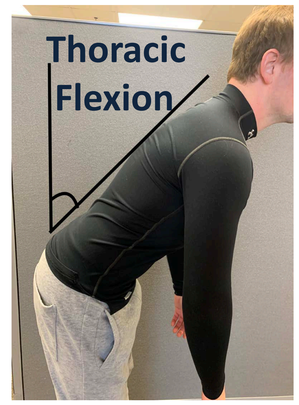
- **Data Collection Tools**
  - A maximum voluntary contraction (MVC) was collected for each participant to evaluate muscle activity as a percentage of MVC

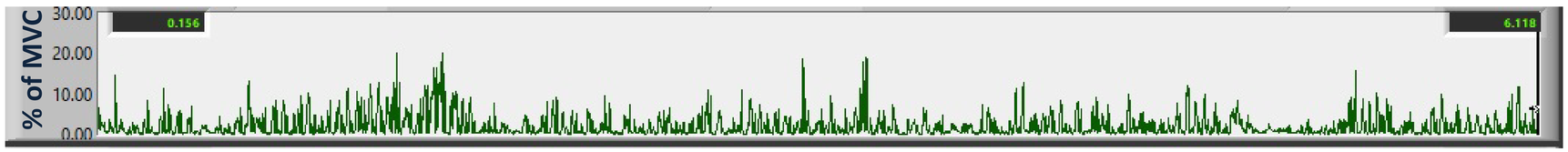
Results

- In comparison to MVC's, muscle activation of the mid deltoid and trapezius muscles do not indicate high force muscle exertions during tobacco cutting and spiking activities
- Awkward postures are the greatest ergonomic risk factor in tobacco harvesting activities

Thoracic Flexion During Spiking Activities

	Mean	Standard Deviation
10th percentile	-2.52	5.28
50th percentile	6.02	5.76
90th percentile	14.56	10.35
% Time in neutral posture	39.72	22.74





Sample Representation of Right Mid Deltoid Muscle Activity During Tobacco Cutting

Discussion

- Results collected indicate that tobacco harvesting activities consist of high repetition, low force tasks that have the potential to result in chronic repetitive motion injuries
- Designing tools to assist in cutting and spiking activities that reduce awkward postures and repetitive movement can significantly reduce the prevalence of musculoskeletal disorders in tobacco harvesters

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