

ERGONOMICS DEMONSTRATION PROJECT

Update

# Fruit Growing And Packing

January 2002



## **Ergonomics demonstration project: Fruit growing and packing**

Despite many advances that the fruit growing and packing industry has made in mechanization, the industry still relies heavily on manual labor in order to ensure the quality of the product. Many of the jobs that are found throughout the industry involve risk factors that are covered by the ergonomics rule, especially highly repetitive motions and frequent, awkward lifting. A recent study by the University of Washington (UW) found a high prevalence of Work-Related Musculoskeletal Disorder (WMSD) symptoms among fruit packers. The study also found several risk factors that can contribute to WMSDs, and identified some potential solutions.

In May 2000, the Department of Labor and Industries (L&I) adopted an ergonomics rule intended to reduce the incidence of WMSDs in Washington workplaces. The Washington State Farm Bureau recognized that the rule would apply to many of the operations in fruit growing and packing, and requested a demonstration project to look at these issues. Separately, a fruit growing and packing company that had participated in the UW study also asked to be part of the project.

The project began in October 2000, when growers and packers identified jobs that they felt would be covered by the rule and were likely to involve hazards that would require controls. These jobs included work done in packinghouses, as well as tree pruning work done in the orchards. An L&I ergonomist videotaped and analyzed the jobs and interviewed management and workers in order to verify these assumptions.

Several WMSD hazards as defined by the ergonomics rule have been identified as common to packing operations, and there is good agreement between the demonstration project and the UW study findings. Hazards were also identified in tree pruning, which was not part of the UW study.

The first major product from this demonstration project is a checklist that identifies common caution zone and hazard zone risk factors in the tree fruit industry. Caution zone jobs require ergonomics awareness education for employees who work in them, as well as their supervisors. Caution zone jobs must also be evaluated further to see if hazards exist. It is only at the hazard level that jobs would require changes. Employers must implement controls in hazard zone jobs in order to reduce risk factor exposures below hazardous levels, or to the degree technologically and economically feasible.

The table below shows the timeline that fruit growers and packers must follow when complying with the ergonomics rule:



| <b>Number of annual Full Time Equivalents (FTEs)*</b> | <b>Awareness Education And Hazard Analysis Completed</b> | <b>Hazard Reduction Completed</b> |
|---|--|-----------------------------------|
| 50 or more  | July 1, 2003   | July 1, 2004                      |
| 11-49   | July 1, 2004   | July 1, 2005                      |
| 10 or fewer   | July 1, 2005   | July 1, 2006                      |


\* This is the number of employees averaged out over a year, NOT peak employment. To determine the number of full-time equivalents (FTEs), divide the lowest number of hours reported to industrial insurance for hours worked in Washington, in any calendar year from 2000 through the most recent complete calendar year, by the number 2000.

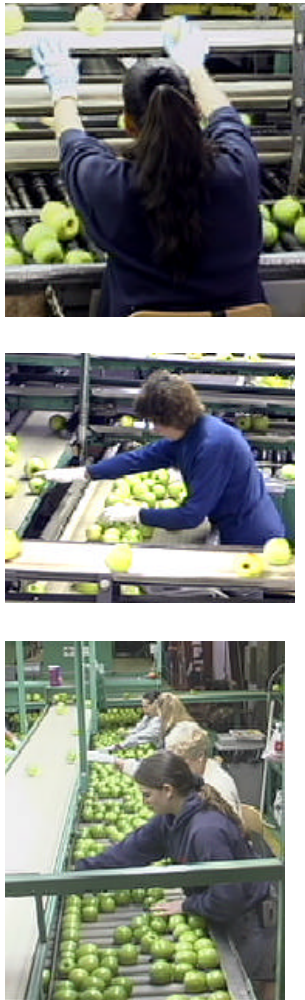
## Checklist of Caution Zone and Hazard Zone Risk Factors in Fruit Growing and Packing



This checklist is based on findings from an Ergonomics Demonstration Project conducted by the Department of Labor and Industries, the Washington State Farm Bureau, and participating packinghouses; and on the results of a study done in several packinghouses by the University of Washington (see reference at end of checklist). The risk factors listed in this checklist were ones that were found to be common across a number of orchards and packinghouses in these two studies.




You can use this checklist to narrow your focus when analyzing the jobs that are listed. Please note that not all jobs in the industry were covered and that, depending on the processes present in your workplace, you may have risk factors present in a job that are not listed here. Refer directly to the rule for a complete list of all of the risk factors if you have a process that does not resemble the ones pictured here.

| Season | Job  | Caution Zone  | Hazard Zone   |
|--------|--|---|---|
| Winter | Pruning<br><br> | <input type="checkbox"/> <b>Awkward Postures:</b> Working with the hand(s) above the head, or the elbow(s) above the shoulder, more than 2 hours total per day<br><input type="checkbox"/> <b>Highly Repetitive Motions:</b> Repeating the same motion with the neck, shoulders, elbows, wrists, or hands (excluding keying activities) with little or no variation every few seconds more than 2 hours total per day<br><input type="checkbox"/> <b>Other (see page 3 of the Ergonomics Rule):</b> | <input type="checkbox"/> <b>Awkward Postures:</b> Repetitively raising the hands above the head or the elbows above the shoulders more than once per minute, more than 4 hours total per day.<br><input type="checkbox"/> <b>Highly Repetitive Motions:</b> Using the same motion with little or no variation every few seconds (excluding keying activities), with no other risk factors, more than 6 hours total per day.<br><input type="checkbox"/> <b>Other (see Appendix B of the Ergonomics Rule):</b> |


| Season | Job  | Caution Zone  | Hazard Zone   |
|--------|--|---|---|
| Fall   | Picking<br> | <ul style="list-style-type: none"> <li><input type="checkbox"/> <b>Awkward Postures:</b><br/>Working with the hand(s) above the head, or the elbow(s) above the shoulder, more than 2 hours total per day</li> <li><input type="checkbox"/> <b>Highly Repetitive Motions:</b> Repeating the same motion with the neck, shoulders, elbows, wrists, or hands (excluding keying activities) with little or no variation every few seconds more than 2 hours total per day</li> <li><input type="checkbox"/> <b>Other (see page 3 of the Ergonomics Rule):</b></li> </ul> | <ul style="list-style-type: none"> <li><input type="checkbox"/> <b>Awkward Postures:</b><br/>Repetitively raising the hands above the head or the elbows above the shoulders more than once per minute, more than 4 hours total per day.</li> <li><input type="checkbox"/> <b>Highly Repetitive Motions:</b> Using the same motion with little or no variation every few seconds (excluding keying activities), with no other risk factors, more than 6 hours total per day.</li> <li><input type="checkbox"/> <b>Other (see Appendix B of the Ergonomics Rule):</b></li> </ul> |

| Season                        | Job   | Caution Zone   | Hazard Zone  |
|-------------------------------|---|--|--|
| Year-round<br>(peaks in fall) | <p>Pre-Sorting and Sorting</p>  | <ul style="list-style-type: none"> <li> <input type="checkbox"/> <b>Awkward Postures:</b><br/>Working with the hand(s) above the head, or the elbow(s) above the shoulder, more than 2 hours total per day                     </li> <li> <input type="checkbox"/> <b>Awkward Postures:</b><br/>Working with the neck or back bent more than 30 degrees (without support and without the ability to vary posture) more than 2 hours total per day.                     </li> <li> <input type="checkbox"/> <b>Highly Repetitive Motions:</b> Repeating the same motion with the neck, shoulders, elbows, wrists, or hands (excluding keying activities) with little or no variation every few seconds more than 2 hours total per day                     </li> <li> <input type="checkbox"/> <b>Other (see page 3 of the Ergonomics Rule):</b> </li> </ul> | <ul style="list-style-type: none"> <li> <input type="checkbox"/> <b>Awkward Postures:</b><br/>Repetitively raising the hands above the head or the elbows above the shoulders more than once per minute, more than 4 hours total per day.                     </li> <li> <input type="checkbox"/> <b>Highly Repetitive Motions:</b> Using the same motion with little or no variation every few seconds (excluding keying activities), with no other risk factors, more than 6 hours total per day.                     </li> <li> <input type="checkbox"/> <b>Other (see Appendix B of the Ergonomics Rule):</b> </li> </ul> |

| Season                        | Job   | Caution Zone  | Hazard Zone   |
|-------------------------------|---|---|---|
| Year-round<br>(peaks in fall) | Packing<br><br> | <ul style="list-style-type: none"> <li><input type="checkbox"/> <b>Awkward Postures:</b><br/>Working with the hand(s) above the head, or the elbow(s) above the shoulder, more than 2 hours total per day</li> <li><input type="checkbox"/> <b>Highly Repetitive Motions:</b> Repeating the same motion with the neck, shoulders, elbows, wrists, or hands (excluding keying activities) with little or no variation every few seconds more than 2 hours total per day</li> <li><input type="checkbox"/> <b>Other (see page 3 of the Ergonomics Rule):</b></li> </ul> | <ul style="list-style-type: none"> <li><input type="checkbox"/> <b>Awkward Postures:</b><br/>Repetitively raising the hands above the head or the elbows above the shoulders more than once per minute, more than 4 hours total per day.</li> <li><input type="checkbox"/> <b>Highly Repetitive Motions:</b> Using the same motion with little or no variation every few seconds (excluding keying activities), with no other risk factors, more than 6 hours total per day.</li> <li><input type="checkbox"/> <b>Other (see Appendix B of the Ergonomics Rule):</b></li> </ul> |

| Season     | Job  | Caution Zone   | Hazard Zone  |
|------------|--|--|--|
| Year-round | <p>Re-packing</p>    | <ul style="list-style-type: none"> <li><input type="checkbox"/> <b>Awkward Postures:</b><br/>Working with the neck or back bent more than 30 degrees (without support and without the ability to vary posture) more than 2 hours total per day.</li> <li><input type="checkbox"/> <b>Highly Repetitive Motions:</b> Repeating the same motion with the neck, shoulders, elbows, wrists, or hands (excluding keying activities) with little or no variation every few seconds more than 2 hours total per day</li> <li><input type="checkbox"/> <b>Heavy, Frequent or Awkward Lifting:</b> Lifting objects weighing more than 10 pounds if done more than twice per minute more than 2 hours total per day</li> <li><input type="checkbox"/> <b>Heavy, Frequent or Awkward Lifting:</b> Lifting objects weighing more than 25 pounds above the shoulders, below the knees or at arms length more than 25 times per day</li> <li><input type="checkbox"/> <b>Other (see page 3 of the Ergonomics Rule):</b></li> </ul> | <ul style="list-style-type: none"> <li><input type="checkbox"/> <b>Highly Repetitive Motions:</b> Using the same motion with little or no variation every few seconds (excluding keying activities), with no other risk factors, more than 6 hours total per day.</li> <li><input type="checkbox"/> <b>Heavy, Frequent or Awkward Lifting:</b><br/>Lifting boxes from above the shoulder, between 7" and 12" from the toes, once every 2 to 5 minutes for 2 or more hours per day, without twisting results in a weight limit of 34 pounds.<br/><br/>Lifting boxes from below the knee, between 7" and 12" from the toes, once every 2 to 5 minutes for 2 or more hours per day, while twisting more than 45 degrees results in a weight limit of 36 pounds.</li> <li><input type="checkbox"/> <b>Other (see Appendix B of the Ergonomics Rule):</b></li> </ul> |



| Season                        | Job  | Caution Zone  | Hazard Zone   |
|-------------------------------|--|---|---|
| Year-round<br>(peaks in fall) | Segregating<br>(Palletizing)<br><br> | <input type="checkbox"/> <b>Heavy, Frequent or Awkward Lifting:</b> Lifting objects weighing more than 10 pounds if done more than twice per minute more than 2 hours total per day<br><br><input type="checkbox"/> <b>Other (see page 3 of the Ergonomics Rule):</b> | <input type="checkbox"/> <b>Heavy, Frequent or Awkward Lifting:</b> Lifting boxes from between knee and waist level, close to the body, 4 times per minute for more than 2 hours per day, without twisting results in a weight limit of 40.5 pounds. If the worker twists more than 45 degrees while lifting, the weight limit would be reduced to 34 pounds.<br><br><input type="checkbox"/> <b>Other (see Appendix B of the Ergonomics Rule):</b> |

Reference: *Musculoskeletal Risks in Washington State Apple Packing Companies*. Nancy Simcox, Mary Ellen Flanagan, Janice Camp, Peregrin Spielholz & Karen Snyder. Field Research and Consultation Group, University of Washington Department of Environmental Health, Seattle, WA 98195. (2001)