

POTENTIAL HAZARD

Twisting and Bending (Upper Body)

Less stress is applied to bones, nerves, muscles, ligaments, and tendons when the body works in neutral positions. On US farms in 2014, there were more than **10,000** hand, wrist, and finger, and approximately **15,000** shoulder, chest, back, abdomen, and pelvic region work-related injuries.¹ An employer may pay more than **\$36,000** in indirect costs (associated with training replacement employees, accident investigation, lost productivity, implementation of corrective measures, absenteeism, and lower employee morale) for one employee treated for a work-related muscle strain.²



Recommendation: Avoid Awkward Postures

- Do not work above shoulder level
- Maintain a neutral spine and avoid twisting above the waist
- Do not extend or flex the wrist



Recommendation: Use Tools and Equipment that Allow for Neutral Positions

- Use adjustable workstations and ergonomic handles on tools
- Adjust work surfaces to elbow level or slightly lower
- Use hoists, conveyors, or other mechanical means for moving material

¹National Institute for Occupational Safety and Health. Occupational Injury Surveillance of Production Agriculture Survey, 2014. <https://www.cdc.gov/niosh/topics/aginjury/oispa/pdfs/AI-9-508.pdf> ²Occupational Safety and Health Administration (OSHA). Estimated Costs of Occupational Injuries and Illnesses and Estimated Impact on a Company's Profitability Worksheet (Parameters: strain injury type, 3% profit margin, one employee). <https://www.osha.gov/dcsp/smallbusiness/safetypays/estimator.html>



POTENTIAL HAZARD

Driving Vehicles

In 2016, more than **101,000** emergency department-treated injuries and **337** reported deaths were reported to be related to ATVs.¹ ATV use is reported as the second leading cause of death, behind tractors, in youth working in agriculture.²



ATV with ROPS and proper personal protective equipment (PPE) (Source: [www.semanticscholar.org/paper/REDUCING-ALL-TERRAIN-VEHICLE-INJURIES-\(-ATVs-\)-AND-Rechnitzer-Grzebieta/16274bae54a96cb2e52f523442c310ad5822e972/figure/h](http://www.semanticscholar.org/paper/REDUCING-ALL-TERRAIN-VEHICLE-INJURIES-(-ATVs-)-AND-Rechnitzer-Grzebieta/16274bae54a96cb2e52f523442c310ad5822e972/figure/h))

Recommendation:

Take Safety Precautions Before/During Drive

- Wear a helmet, eye-protection, long pants, sturdy shoes, and a seatbelt (if available)
- Conduct pre-ride inspection of vehicle, including tires, brakes, headlights, attachments, implements, etc.
- Drive at safe speeds and avoid paved roads (paved roads increase risk of rollover)
- Do not allow passengers on the vehicle



Tractor with ROPS (Source: <https://allaroundpower.com/Tractors-Yanmar-Compact-Diesel-Tractor-with-ROPS-YT359-2018-Saint-Johnsbury-VT-d5b9e04f-89dd-4bb5-aese-a85e01655917>)

Recommendation:

Ensure Vehicle is Equipped for Drive

- Follow manufacturer guidelines for weight and towing capacities
- Balance and secure cargo before moving
- Maintain even tire pressures (ATV pulls toward lowest tire pressure)
- Choose a vehicle with a Rollover Protection Structure (ROPS), if available
- Retrofit older vehicles with ROPS

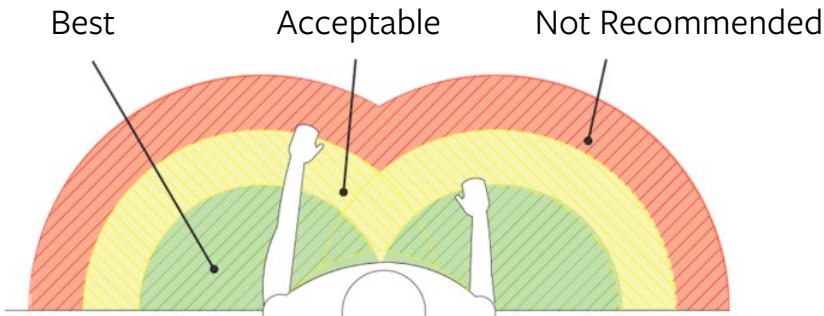
¹Consumer Product Safety Commission. 2016 Annual Report of ATV-Related Deaths and Injuries. https://www.cpsc.gov/s3fs-public/atv_annual_report_2016.pdf?vlcLFTM9VNDc23qe6FQyhJq7A7454xCr ²National Children's Center for Rural and Agricultural Health and Safety. 2017 Fact Sheet Childhood Agricultural Injuries in the US. <https://www.marshfieldresearch.org/Media/Default/NFMC/PDFs/2017%20Child%20Ag%20Injury%20Fact%20Sheet.pdf>



POTENTIAL HAZARD

Reaching and Stretching

On US farms in 2014, approximately **15,000** work-related injuries to the shoulder, chest, back, abdomen, and/or pelvis were reported.¹ An employer may pay more than **\$36,000** in indirect costs (associated with training replacement employees, accident investigation, lost productivity, implementation of corrective measures, absenteeism, and lower employee morale) for one employee treated for a work-related muscle strain.²



Recommendation:
Avoid Reaching/Stretching Outside of Safe Work Zone

Workzones (Adapted from: 3-Workzone Workstations. <https://workplacenh.com/2017/02/13/organize-a-3-zone-workstation/>)

- Work within the “best” or “acceptable” work zones (see image)
- Work with arms at elbow level or slightly lower
- Place tools and materials within the “best” or “acceptable” work zones



Recommendation:
Work at elbow level, or slightly lower

- Use a portable work platform to raise the worker the appropriate level
- Use a foot platform to raise shorter employees to appropriate level
- Use tools that have longer shafts or handles to avoid stretching or reaching

¹National Institute for Occupational Safety and Health. Occupational Injury Surveillance of Production Agriculture Survey, 2014. <https://www.cdc.gov/niosh/topics/aginjury/oispa/pdfs/AI-9-508.pdf> ²Occupational Safety and Health Administration (OSHA). Estimated Costs of Occupational Injuries and Illnesses and Estimated Impact on a Company's Profitability Worksheet (Parameters: strain injury type, 3% profit margin, one employee). <https://www.osha.gov/dccsp/smallbusiness/safety/pays/estimator.html>



POTENTIAL HAZARD

Falling From Ladders and Heights

In 2015, more than **2 out of every 5** fatal falls reported were from heights of **15 feet** or less.¹ If one employee fractures a bone after falling, the employer may pay almost **\$56,000** in indirect costs.² Indirect costs are associated with training replacement employees, accident investigation, lost productivity, implementation of corrective measures, absenteeism, and lower employee morale.



Recommendation:

Climb and Stand on Ladder Safely

- Use the **Three-Point System**: have three of your four limbs in contact with the ladder at all times
- Do not extend waist (belt buckle) beyond the sides of the ladder (do not reach too far to the right or left of the ladder)
- Carry tools in a tool belt or on a pulley system so both hands are free to grasp the ladder sides or rungs
- Do not step on the top two steps of a step-ladder or on the top three rungs of a straight ladder



Recommendation:

Prioritize Fall Prevention & Protection

- Review [OSHA 1910 Subpart D - Walking-Working Surfaces](#) for more detailed information
- Install structural fall prevention³ by requiring at least one of the following fall prevention options for all work above 4 feet:
 - Guardrails, safety net, personal fall arrest system, positioning system, travel restraint system, or ladder safety system
- Use personal fall arrest system (**training required**)³ by requiring the use of a personal fall arrest system (including body harness, anchorage, and connector) to protect against falling or to safely stop a fall

¹US Bureau of Labor Statistics, 2016. <https://www.bls.gov/iif/oshwc/cfoi/cfchoo14.pdf> ²Occupational Safety and Health Administration (OSHA). Estimated Costs of Occupational Injuries and Illnesses and Estimated Impact on a Company's Profitability Worksheet (Parameters: fracture injury type, 3% profit margin, one employee). <https://www.osha.gov/dcsp/smallbusiness/safetypays/estimator.html> ³Occupational Safety and Health Standards, 1910 Walking-Working Surface Subpart D. www.osha.gov/walking-working-surfaces/RegTextWWSFinalRule.pdf



POTENTIAL HAZARD

Falling from Machinery and Equipment

In 2014 and 2015, approximately **20%** of hired crop worker injuries on US farms were due to falls.¹ An employer may pay over **\$65,000** in indirect costs (associated with training replacement employees, accident investigation, lost productivity, implementation of corrective measures, absenteeism, and lower employee morale) if one employee suffers from a work-related concussion.



Unsafe Practice Sitting on Harvester Edge (Source: www.youtube.com/watch?v=fAnmSgDCx6I)

Recommendation:

Operate Machinery and Equipment Safely

- Use a seatbelt
- Only ride where seats or protected work areas are provided
- Do not ride on fenders, draw-bars, or truck beds



Recommendation:

Mount/Dismount Machinery and Equipment Safely

- Practice the **Three-Point System**: always have three of your four limbs in contact with the ladder or vehicle
- Always face the vehicle or equipment and step backwards to get down
- Have a good hand-hold before stepping up or down



Recommendation:

Maintain Safety Features of Machinery/Equipment

- Apply abrasive coatings or skid-resistant products to steps or rungs
- Choose a vehicle with a Rollover Protection Structure (ROPS), if available and/or retrofit older vehicles with ROPS

¹National Institute for Occupational Safety and Health. National Agricultural Workers Survey. Weighted Percentage Distribution of Hired Crop Worker Injuries on the US Farms by Type of Injury Event Tables. <https://www.cdc.gov/niosh/topics/aginjury/news/pdfs/tables-injury/i6-508.pdf> ²Occupational Safety and Health Administration (OSHA). Estimated Costs of Occupational Injuries and Illnesses and Estimated Impact on a Company's Profitability Worksheet (Parameters: concussion injury type, 3% profit margin, one employee). <https://www.osha.gov/dccsp/smallbusiness/safetypays/estimator.html>



POTENTIAL HAZARD

Falling During Sorting

In 2014 and 2015, approximately **20%** of hired crop worker injuries on US farms were due to falls.¹ If one employee fractures a bone after falling, the employer may pay almost **\$56,000** in indirect costs.² Indirect costs are associated with training replacement employees, accident investigation, lost productivity, implementation of corrective measures, absenteeism, and lower employee morale.

Recommendation:

Wear the Right Clothes for the Right Task

- Do not wear loose clothing that may get caught in moving parts (e.g., hoodie strings)
- Secure long hair with band or under hat
- Wear gloves that match the job (rubber, neoprene, leather, etc.)
- Soles and heels should be slip resistant and water resistant
- Shoe should support the ankle
- Steel toes should be included if there is potential for crushing of the foot or toes
- ANSI Z41.1 marking in shoe for compression/impact approval



- ▲ Do not stand on edges of machinery
- ▲ Clearly identify prohibited areas with hazard markings

Unsafe Practice Standing on Potato Sorter (Source: <https://www.youtube.com/watch?v=s7ARuqIQ790>)

¹National Institute for Occupational Safety and Health. National Agricultural Workers Survey. Weighted Percentage Distribution of Hired Crop Worker Injuries on the US Farms by Type of Injury Event Tables. <https://www.cdc.gov/niosh/topics/aginjury/news/pdfs/tables-injury/i6-508.pdf>. ²Occupational Safety and Health Administration (OSHA). Estimated Costs of Occupational Injuries and Illnesses and Estimated Impact on a Company's Profitability Worksheet (Parameters: fracture injury type, 3% profit margin, one employee). <https://www.osha.gov/dcsp/smallbusiness/safety/pays/estimator.html>



POTENTIAL HAZARD

Lifting and Carrying Materials

In 2014 and 2015 on US farms, approximately **40%** of hired crop worker injuries were classified as a sprain or strain.¹ An employer may pay almost **\$36,000** of indirect costs for one employee suffering from a work-related back strain. Indirect costs are associated with training replacement employees, accident investigation, lost productivity, implementation of corrective measures, absenteeism, and lower employee morale.



Work in the Power Zone (Source: Occupational Safety and Health Administration. Ergonomics eTool. <https://www.osha.gov/SLTC/etools/electricalcontractors/supplemental/principles.html>)

Recommendation:

Use Good Techniques When Lifting Loads

- Lift and carry load in the “hand shake” zone, which is a forearm distance away from the body
- Carry load in the “power” zone, which is between mid-thigh and mid-chest height
- Keep load compact and close to the body
- Use the muscle power of your legs to lift, keeping your back straight
- Avoid twisting and reaching (move feet to change direction)



Hydraulic 4-Wheeled Table Cart (Source: www.homedepot.com/p/BLACK-BULL-Steel-Hydraulic-4-Wheeled-Table-Cart-in-Black-800845/205862610)

Recommendation:

Use Lifting Devices and Appropriate Tools to Transport Material

- Use containers with good grips or add handholds
- When moving material across distances, use conveyors and wheeled carts
- When moving material across work surfaces with varying heights, use mechanical lifting devices with adjustable heights
- When moving material across work surfaces that are at the same height, use vehicles or carts to transport materials

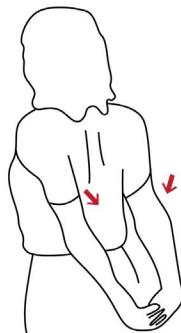
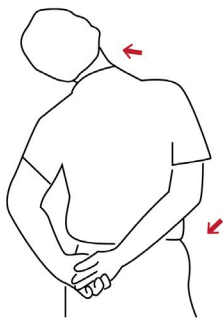
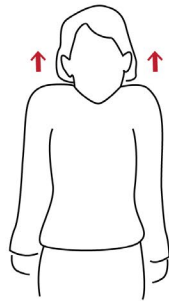
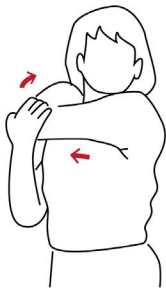
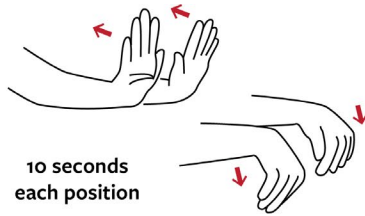
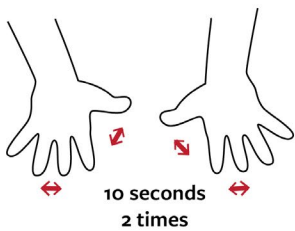
¹National Institute for Occupational Safety and Health. National Agricultural Workers Survey. Weighted Percentage Distribution of Hired Crop Worker Injuries on the US Farms by Type of Injury Event Tables. <https://www.cdc.gov/niosh/topics/aginjury/news/pdfs/tables-injury/i3-508.pdf> ²Occupational Safety and Health Administration (OSHA). Estimated Costs of Occupational Injuries and Illnesses and Estimated Impact on a Company's Profitability Worksheet (Parameters: strain injury type, 3% profit margin, one employee). <https://www.osha.gov/dcs/smallbusiness/safety/pays/estimator.html>



POTENTIAL HAZARD

Performing the Same Task Repetitively (Upper Body)

Performing the same task repetitively can increase the risk for **musculoskeletal disorders** (MSDs) and may increase the risk of injury. Work-related MSDs are among the most frequently reported causes of lost or restricted work time.¹ An employer may pay over **\$33,000** in indirect costs (associated with training replacement employees, accident investigation, lost productivity, implementation of corrective measures, absenteeism, and lower employee morale) for one employee suffering from work-related carpal tunnel syndrome.²



Recommendation: Vary Work Duties

- Take short breaks
- Provide standing employees a chance to sit and seated workers a chance to stand
- Combine tasks to vary work between standing and sitting

Recommendation: Rest and Stretch Throughout the Day

- Rest the eyes by looking in the distance
- Perform stretching exercises (see image)
 - Consult physician before starting a new exercise program
- Use automation when possible

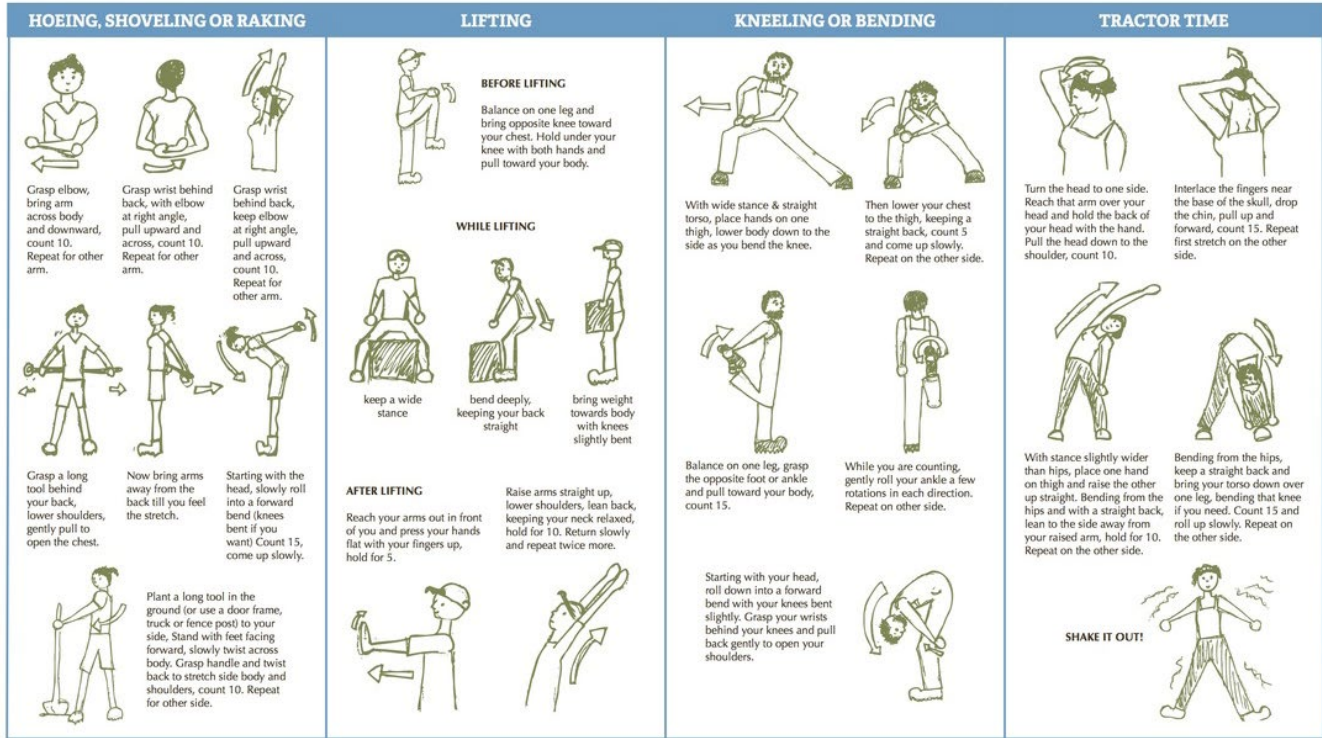
¹Occupational Safety and Health Administration. Ergonomics. <https://www.osha.gov/SLTC/ergonomics/> ²Occupational Safety and Health Administration (OSHA). Estimated Costs of Occupational Injuries and Illnesses and Estimated Impact on a Company's Profitability Worksheet (Parameters: carpal tunnel syndrome injury type, 3% profit margin, one employee). <https://www.osha.gov/dcsp/smallbusiness/safetypays/estimator.html>



POTENTIAL HAZARD

Standing/Sitting for Extended Periods of Time

Maintaining the same posture for an extended period of time can cause pooling of blood, muscle fatigue, and boredom.¹ In 2014, over **9,000** work-related injuries on US farms were due to overexertion leading to fatigue.²



The Flexible Farmer. (Adapted from: <http://www.theflexiblefarmer.com/market.html>)

Recommendation: Vary Work Duties and Change Postures Frequently

- Vary job duties to allow for changes in posture
- Provide standing employees a chance to sit and seated workers with a chance to stand
- Perform stretching exercises multiple times throughout the day (see image)
 - Consult physician before starting a new exercise program

Recommendation: Use Equipment to Reduce Fatigue

- Rest one foot on a short (less than 12 inches) step stool when standing for long periods of time
- Provide a chair or bench with a sturdy backrest
- Install anti-fatigue mats on hard surfaces where standing is required

¹Occupational Safety and Health Administration, Ergonomics eTool. <https://www.osha.gov/SLTC/etools/electricalcontractors/supplemental/hazardindex.html#static> ²National Institute for Occupational Safety and Health. Occupational Injury Surveillance of Production Agriculture Survey, 2014. <https://www.cdc.gov/niosh/topics/aginjury/oispa/pdfs/AI-11-508.pdf>



POTENTIAL HAZARD

Falling/Tripping While Transporting Materials

In 2014, more than **10,000** falls, slips, and trips in agricultural work-related injuries on US farms were reported.¹ The employer may pay almost **\$33,000** in indirect costs (associated with training replacement employees, accident investigation, lost productivity, implementation of corrective measures, absenteeism, and lower employee morale) when one employee sprains a limb after tripping on the job.²



Recommendation:

Wear ANSI-Approved Shoes or Boots

- Soles and heels should be slip resistant and water resistant
- Shoe should support the ankle
- Steel toes should be included if there is potential for crushing of the foot or toes
- ANSI Z41.1 marking in shoe for compression/impact approval



Recommendation:

Improve Travel Paths

- Clear paths of debris and tripping hazards
- Clean up and dry spills
- Light paths well and avoid glare by wearing visor, brimmed hat, or ANSI Z87.1-approved sunglasses



Steel Multi-Use Cart (Source: www.homedepot.com/p/Gorilla-Carts-1-200-lb-Steel-Multi-Use-Dump-Cart-GORMP-12/203353112)

Recommendation:

Make Transport Easier

- Place work surfaces near each other
- Reduce height differences between work surfaces by using adjustable work stands and platforms
- Transport materials in containers on wheels (rollers or trolleys)

¹National Institute for Occupational Safety and Health. Occupational Injury Surveillance of Production Agriculture Survey, 2014. <https://www.cdc.gov/niosh/topics/aginjury/oispa/pdfs/AI-11-508.pdf> ²Occupational Safety and Health Administration (OSHA). Estimated Costs of Occupational Injuries and Illnesses and Estimated Impact on a Company's Profitability Worksheet (Parameters: sprain injury type, 3% profit margin, one employee). <https://www.osha.gov/dcsp/smallbusiness/safetypays/estimator.html>

