

Tractor & Machinery Operations: Science of Stability



Photo Credit: Penn State Agricultural Safety and Health Team

Outline

- Hazards and Risk
- Pre-operation Checks
- Tractor Operations



Hazards and Risk Assessment

- Hazard
 - Any existing or potential condition which, by itself or by interaction with other variables, can result in injury, illness, death or other loss.
 - Risk
 - A measure of the combined probability and severity of possible harm;
 - mathematically risk is the product of: probability x severity
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Tractor and Machinery Hazards

Tractors account for 1/3 of farm fatalities

50% of tractor related fatalities are from roll-overs

Runovers

Entanglements



Tools

- Risk Assessment forms
 - SaferFarm
 - Job Safety Analysis
 - Preventive Maintenance checklist
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SaferFarm.org – Farm Hazard Analysis Tool

Tractors

ROPS

Least Protection

1. No ROPS installed on the tractor or tractor with weather cab only.
2. A modified or homemade ROPS.
3. Two-post ROPS.
4. ROPS cab with missing or improperly shutting door or missing window glass; a 4-post ROPS.
5. ROPS cab with all glass in place and a door that shuts properly.

Most Protection



Item:	Item:	Item:	Item:	Item:
<input type="radio"/> 01				
<input type="radio"/> 02				
<input type="radio"/> 03				
<input type="radio"/> 04				
<input type="radio"/> 05				

Farm: _____

Inspector: _____

Date: _____



PennState

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Youth Rules

- Department of Labor
 - Wage and Hour
 - Hazardous occupations in agriculture
 - Age 16 or older
 - Exemptions
 - Tractor and Machinery 14-15 year old youth
 - Must be trained and certified by Agriculture teacher or Extension
 - Parent owned farm
 - Student-learner
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Pre-operation Inspections

- Review
 - ground conditions, terrain, obstacles
- Complete visual inspection of equipment
 - Lights
 - Brakes
 - Steering
 - Tires
 - Fluids

Operating the Tractor

- Roll-overs hazard
 - Side
 - Rear
- Run-overs hazard
 - Bystanders
- Falls
- Noise
- Eye Injury
- Entanglement



Safe Operations

Always face the tractor for mounting and dismounting. Use three points of contact. Never jump from the tractor.

Fasten Seat Belt
(ROPS equipped tractor)

Avoid ditches, embankments, and holes

Reduce speed when turning, crossing slopes, and on rough, slick, or muddy ground

Stay off slopes too steep for safe operation



Safe Operation

Watch where you are going

No riders

Avoid jerky turns, starts, and stops

Hitch properly (Drawbar and three-point)

Set brakes securely when stopped
(parking brake)

