

Additional sources of tractor safety information

- *The Farm Safety Guide*. Saskatchewan Labour. Occupational Health and Safety:
Tel: 1-877-419-3510
- *Health and Safety Guidelines for Tractor Operation*. Farm Safety Association Inc.
www.fsai.on.ca or Tel: (519) 823-5600
- *Safe Tractor Assessment Rating System*. Monash University Accident Research Centre,
Australia. www.general.monash.edu.au/muarc/stars.htm
- *Be Seen, Be Safe!* Prairie Agricultural Machinery Institute. www.pami.ca/beseenbesafe
- *North American Guidelines for Children's Agricultural Tasks: Tractor Fundamentals*.
www.nagcat.org or contact Saskatchewan Labour's Farm Safety Program:
Tel: 1-877-419-3510

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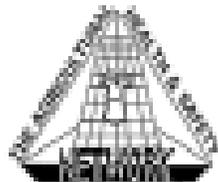
Special thanks to:

Canadian Agricultural Injury Surveillance Program, Saskatchewan Collaborators, for graphs and statistics on tractor-related deaths and injuries in Saskatchewan

Farm Safety Ass'n. Inc. for information from the *Agricultural Safety Audit Program: Hazard Identification – Checklists and Action Plan*

Monash University, Australia for information from the *Safe Tractor Assessment Rating System*

Canadian Federation of Agriculture for graphics from the *Farm Safety Photo CD-ROM*



Your Personal Farm Safety Audit

A checklist safety management tool

Reduce the risk of accidental loss in your farm operation by applying these simple management practices.

MODULE 1 • TRACTOR SAFETY

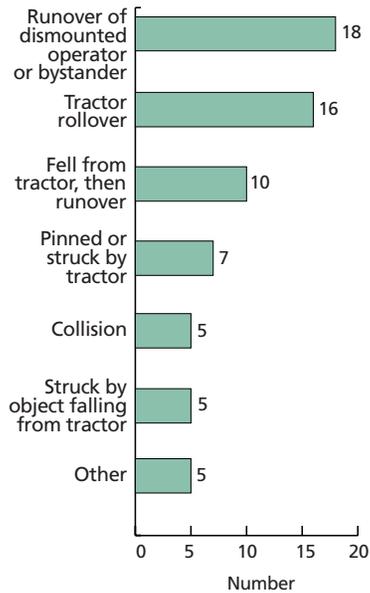


Farm Safety Audit: Tractor Module

The Farm Safety Audit is a management tool that can minimize the risk of work-related death or injury on your farm and maximize your productivity and profitability. The Tractor Module addresses tractor hazards, the most common cause of work-related death and serious injury on Saskatchewan farms.

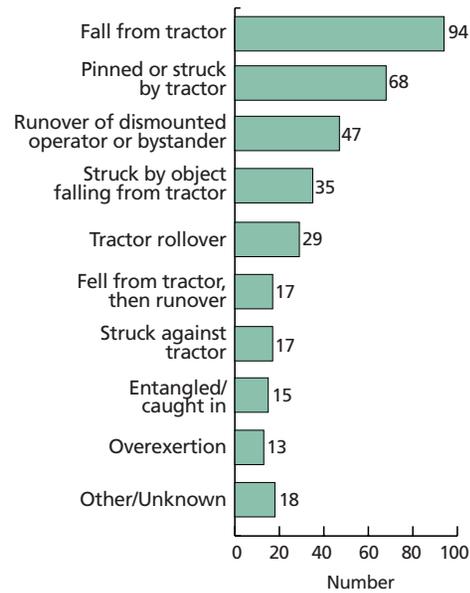
Tractor fatalities in Saskatchewan,

April 1990 – March 2000 (n=66)



Hospitalized tractor injuries in Saskatchewan,

April 1990 – March 2000 (n=353)



AUDIT HOW-TO . . . one step at a time

STEP
1

Inspect your equipment and operating techniques and identify hazards

- Use the checklists to assist you during your inspection.
- Enlist an outside pair of eyes or another family member to help recognize hazards.
- Complete the **white section** of the checklist during your inspection and the **green section** after your inspection.

STEP
2

Classify hazards and assess risk

- When you have completed your inspection, complete the **green section** of the checklist. Where you have checked YES on a checklist, no further action is required.
- Where you have checked NO, rate the priority for action of the hazard as HIGH, MODERATE or LOW based on the following table. This step helps you spend ten dollars worth of energy on a ten dollar problem, and not on a ten cent problem.
- Indicate what action is required to eliminate or reduce the hazard, and its estimated cost in dollars or time. You now have a work sheet.

Priority for Action Table

What is the likely outcome?	How often am I or other people exposed to the hazard?			
	Daily	Weekly	Monthly	Rarely
Death or permanent disability	HIGH	HIGH	HIGH	HIGH
Temporary disability	HIGH	HIGH	MODERATE	MODERATE
Minor (first aid) injury	HIGH	MODERATE	LOW	LOW

HIGH

The danger is too great to ignore. Immediate action is required. Consider discontinuing operation until correction completed.

MODERATE

Risk is serious. Prompt attention is required.

LOW

Minor danger. Attention is indicated. Always look for ways to improve safety.

STEP
3

Take corrective action – the most important step in the audit

- Based on priorities you established in Step 2, decide what corrective actions you can take now, and what actions will require more planning and/or budget.
- Make a commitment by selecting a target date for the completion of each corrective action.
- When older equipment does not meet the checklist's "Physical Conditions," it is doubly important to follow the recommended "Safe Work Practices."

STEP
4

Continue to monitor safety

- Make safety auditing a regular part of your farm management practices.
- Assess the effectiveness of actions you have implemented.
- Remember, there are no short cuts to safety. *"The minutes you save may be spent in the grave."*

Roll Over Prevention

One in four tractor-related deaths on Saskatchewan farms is due to a roll over.

• **Almost 80% of roll overs are sideways** • **About 20% of roll overs are rearwards**

These deaths are preventable with a Roll Over Protective Structure (ROPS) and seat belt.

Retrofits are available for many older tractors. Check with a dealer whether a ROPS is available for your tractor.

Y	N	Physical Condition	Priority for Action HIGH/MED/LOW	What action is required	Cost	Target Date
<input type="checkbox"/>	<input type="checkbox"/>	Does the tractor have a ROPS or ROPS-compliant cab?				
<input type="checkbox"/>	<input type="checkbox"/>	If tractor has a collapsible ROPS, can it be erected and latched in the erect position?				
<input type="checkbox"/>	<input type="checkbox"/>	If tractor has a ROPS, is there a seat belt in working order, anchored to the seat?				
<input type="checkbox"/>	<input type="checkbox"/>	Does tractor have a decal warning against high hitches?				
<input type="checkbox"/>	<input type="checkbox"/>	Are brakes able to hold the tractor's rated load?				
<input type="checkbox"/>	<input type="checkbox"/>	Are brakes evenly adjusted so tractor will not pull to one side?				
<input type="checkbox"/>	<input type="checkbox"/>	Can brakes be interlocked for road travel?				
<input type="checkbox"/>	<input type="checkbox"/>	Is steering balanced? (Push and pull tie rod ends to check for looseness.)				
<input type="checkbox"/>	<input type="checkbox"/>	Do brakes have non-slip pedals?				
<input type="checkbox"/>	<input type="checkbox"/>	Are tires properly inflated and free of defects?				
<input type="checkbox"/>	<input type="checkbox"/>	Does tractor have an emergency exit additional to doors? (pop-out window?)				
Y	N	Safe Work Practice				
<input type="checkbox"/>	<input type="checkbox"/>	If tractor has a ROPS, do you always wear the seat belt while operating?				
<input type="checkbox"/>	<input type="checkbox"/>	Do you always steer clear of hazards such as ditches and soft areas?				
<input type="checkbox"/>	<input type="checkbox"/>	Do you slow down for turns?				
<input type="checkbox"/>	<input type="checkbox"/>	Do you back up steep slopes and back out of ditches?				
<input type="checkbox"/>	<input type="checkbox"/>	Do you use engine braking when going downhill with a heavy load?				
<input type="checkbox"/>	<input type="checkbox"/>	If you must turn on a slope, do you turn downhill?				
<input type="checkbox"/>	<input type="checkbox"/>	Do you approach and pick up round bales from the downhill side?				
<input type="checkbox"/>	<input type="checkbox"/>	Do you estimate the weight of a load and check the operator's manual to be sure it is within tractor's rated weight?				

Note: When older equipment does not meet the checklist's Physical Conditions, it is doubly important to follow the Safe Work Practices.

Run Over Prevention

Four in ten tractor-related deaths on Saskatchewan farms are the result of tractor run overs. The most common scenarios are:

- Run over of a bystander not seen by the tractor operator (28%)
- Operator run over while jump-starting/starting tractor from the ground (21%)
- Operator falls from or is knocked off the tractor and is run over by the tractor or an attachment (19%)
- Operator is run over by unmanned tractor or tractor thought to be parked (17%)
- Rider fell from tractor and was then run over (15%)

Y	N	Physical Condition	Priority for Action HIGH/MED/LOW	What action is required	Cost	Target Date
<input type="checkbox"/>	<input type="checkbox"/>	Is parking brake able to hold the rated load?				
<input type="checkbox"/>	<input type="checkbox"/>	Can parking brake be easily applied?				
<input type="checkbox"/>	<input type="checkbox"/>	Is parking brake resistant to disengagement by children or animals?				
<input type="checkbox"/>	<input type="checkbox"/>	Is neutral start operative (ie: Neutral start has not been by-passed.)?				
<input type="checkbox"/>	<input type="checkbox"/>	Is there a guard on the solenoid?				
<input type="checkbox"/>	<input type="checkbox"/>	Is clutch depression required for gear engagement or does power shuttle require compound movement (two steps)?				
<input type="checkbox"/>	<input type="checkbox"/>	Are cabin doors and handles secure?				
Y	N	Safe Work Practice				
<input type="checkbox"/>	<input type="checkbox"/>	Before operating, do you walk around tractor making a visual check for bystanders and other objects?				
<input type="checkbox"/>	<input type="checkbox"/>	Do you start tractor only from the operator's seat?				
<input type="checkbox"/>	<input type="checkbox"/>	Do you NEVER start up by shorting out the solenoid?				
<input type="checkbox"/>	<input type="checkbox"/>	When required to jump-start tractor, do you make sure it is out of gear and only attempt to crank it from the operator's seat?				
<input type="checkbox"/>	<input type="checkbox"/>	Do you have a NO SEAT - NO RIDER policy (unless training an operator aged 12 years or older)?				
<input type="checkbox"/>	<input type="checkbox"/>	Do you operate at slow speeds on uneven ground?				
<input type="checkbox"/>	<input type="checkbox"/>	Do you NEVER jump on or off a moving tractor?				
<input type="checkbox"/>	<input type="checkbox"/>	Do you keep step treads free of mud and debris?				
<input type="checkbox"/>	<input type="checkbox"/>	Do you NEVER operate when your reaction time could be slowed by medications or alcohol?				
<input type="checkbox"/>	<input type="checkbox"/>	Before shutting off tractor, do you put gears in neutral and set brake every time?				

Note: When older equipment does not meet the checklist's Physical Conditions, it is doubly important to follow the Safe Work Practices.

User Protection

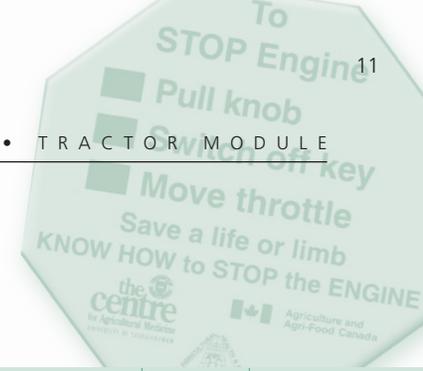
While roll overs and run overs are responsible for the majority of tractor related deaths on Saskatchewan farms, operators also risk injury when guards are missing or service access is difficult. Other hazards include exposure to indoor exhaust, noise and sun.

Y	N	Physical Condition	Priority for Action HIGH/MED/LOW	What action is required	Cost	Target Date
<input type="checkbox"/>	<input type="checkbox"/>	Is the PTO fitted with a master guard (best option)? OR Is the PTO fitted with a cup guard (next best option)?				
<input type="checkbox"/>	<input type="checkbox"/>	Is the engine fan guard in place?				
<input type="checkbox"/>	<input type="checkbox"/>	Are no other guards missing?				
<input type="checkbox"/>	<input type="checkbox"/>	Does tractor have satisfactory access to and/or handling of: <ul style="list-style-type: none"> • Filters (air conditioning, fuel, oil)? • Grease nipples? • Radiator filling? • Differential/transmission dip sticks? • Racked weights? • Jacking points clearly indicated on tractor frame? 				
<input type="checkbox"/>	<input type="checkbox"/>	Is exhaust system in good condition and leak free?				
<input type="checkbox"/>	<input type="checkbox"/>	Does cab have working air conditioning?				
<input type="checkbox"/>	<input type="checkbox"/>	Does cab have UV glass?				
<input type="checkbox"/>	<input type="checkbox"/>	Is sound level at the operator's ear less than 85 decibels?				
<input type="checkbox"/>	<input type="checkbox"/>	Is a fire extinguisher located on the tractor?				
<input type="checkbox"/>	<input type="checkbox"/>	Is a First Aid kit available (mounted on tractor or in service vehicle)?				
Y	N	Safe Work Practice				
<input type="checkbox"/>	<input type="checkbox"/>	Do you NEVER bypass safety mechanisms for any reason?				
<input type="checkbox"/>	<input type="checkbox"/>	When operating tractor in a building, do you open doors and windows and start ventilation fans or run a hose from the exhaust to the outside?				
<input type="checkbox"/>	<input type="checkbox"/>	Do you NEVER refuel tractor while engine is running or hot?				
<input type="checkbox"/>	<input type="checkbox"/>	Do you avoid refuelling inside buildings?				
<input type="checkbox"/>	<input type="checkbox"/>	If tractor does not have a sound-proof cab, do you wear hearing protection?				
<input type="checkbox"/>	<input type="checkbox"/>	If tractor does not have a cab, do you use clothing and sun screen to protect your skin from UV radiation?				

Note: When older equipment does not meet the checklist's Physical Conditions, it is doubly important to follow the Safe Work Practices.

Information and Controls

Problems with controls are not always an obvious cause of accidents. When a fatal accident occurs in the absence of witnesses, which is common on farms, it can be difficult to reconstruct the sequence of events.



Y	N	Physical Condition	Priority for Action HIGH/MED/LOW	What action is required	Cost	Target Date
<input type="checkbox"/>	<input type="checkbox"/>	Do you have a manual for the tractor?				
<input type="checkbox"/>	<input type="checkbox"/>	Is engine stop control a key switch (best option)? OR Is engine stop control mechanical, requiring a pull motion (next best option)?				
<input type="checkbox"/>	<input type="checkbox"/>	In either case, does engine stop control remain in the STOP position when released?				
<input type="checkbox"/>	<input type="checkbox"/>	If stop control is mechanical, is it located in a position where it can be bumped while getting on or off tractor?				
<input type="checkbox"/>	<input type="checkbox"/>	Do travel gears engage cleanly and stay in gear required?				
<input type="checkbox"/>	<input type="checkbox"/>	Does PTO or other power transfer system require a compound action (two steps) to engage it?				
<input type="checkbox"/>	<input type="checkbox"/>	Must PTO or other power transfer system be disengaged before tractor will start?				
<input type="checkbox"/>	<input type="checkbox"/>	If stopping engine requires more than a key switch, is there an instruction decal to inform others in an emergency?				
<input type="checkbox"/>	<input type="checkbox"/>	Are warning decals for operating controls, guards, three- point linkage, PTO and other power transfer systems in place and clearly readable?				
Y	N	Safe Work Practice				
<input type="checkbox"/>	<input type="checkbox"/>	Have you read the operator's manual and do you follow its operating, maintenance and safety instructions?				
<input type="checkbox"/>	<input type="checkbox"/>	Have all tractor operators on your farm reviewed the manual and received training?				
<input type="checkbox"/>	<input type="checkbox"/>	Do you always shut power off before dismounting to service tractor or attached equipment?				
<input type="checkbox"/>	<input type="checkbox"/>	Do you remove keys, set brakes and lock transmission before leaving the tractor?				

Note: When older equipment does not meet the checklist's Physical Conditions, it is doubly important to follow the Safe Work Practices.

Safety of Others

In Saskatchewan, one in five tractor-related deaths is the result of a bystander run over. Children account for over half the fatalities. Seniors are frequent victims, too. Others at risk for tractor-related injury are persons working alongside the tractor operator and drivers sharing public roadways with tractor operators.

Y	N	Physical Condition	Priority for Action HIGH/MED/LOW	What action is required	Cost	Target Date
<input type="checkbox"/>	<input type="checkbox"/>	Is driver's seat height adjustable?				
<input type="checkbox"/>	<input type="checkbox"/>	Is driver's forward view unobstructed?				
<input type="checkbox"/>	<input type="checkbox"/>	Do adjustable rear view mirrors let driver see past towed loads, beyond outside rear wheels and directly behind?				
<input type="checkbox"/>	<input type="checkbox"/>	Is tractor fitted with headlights and are headlights kept clean?				
<input type="checkbox"/>	<input type="checkbox"/>	Is tractor fitted with yellow turn indicators?				
<input type="checkbox"/>	<input type="checkbox"/>	Are clearance lights including tail lights and reflectors in place?				
<input type="checkbox"/>	<input type="checkbox"/>	Is a Slow Moving Vehicle emblem clearly visible on the rear of the tractor?				
<input type="checkbox"/>	<input type="checkbox"/>	Is tractor fitted with a human presence sensor fitted on the rear (alarm sounds only if operator is on seat)?				
<input type="checkbox"/>	<input type="checkbox"/>	Is tractor fitted with a constant flashing beacon, on top of cab or ROPS, keyed to work lights and operational when ignition is on? (best option) OR Is there a constant flashing beacon, on top of cab or ROPS, operational when the tractor is in motion, either keyed to ignition or manual? (next best option)				
<input type="checkbox"/>	<input type="checkbox"/>	Is there a beeper for reverse on a time-limited switch and louder than 87 decibels? (best option) OR Is there a beeper, keyed to ignition, activated manually or not time limited in reverse louder than 87 decibels? (next best option)				
Y N Safe Work Practice						
<input type="checkbox"/>	<input type="checkbox"/>	Do you always use flashing lights while travelling on public roadways?				
<input type="checkbox"/>	<input type="checkbox"/>	Do you clearly indicate all turns when operating on public roadways?				
<input type="checkbox"/>	<input type="checkbox"/>	Do you ensure that only persons with a Driver's Licence operate the tractor on public roadways?				
<input type="checkbox"/>	<input type="checkbox"/>	Do you know and use standard hand signals when verbal communication with a co-worker is unreliable due to noise?				

Note: When older equipment does not meet the checklist's Physical Conditions, it is doubly important to follow the Safe Work Practices.

Optional Equipment Safety

Tractors are mostly operated with implements, usually attached to the rear but also to the front. These implements are major causes of death and injury.

Y	N	Physical Condition	Priority for Action HIGH/MED/LOW	What action is required	Cost	Target Date
<input type="checkbox"/>	<input type="checkbox"/>	Is the 3-point linkage master control (in cabin or on platform) inoperable when standing on the ground, drawbar or linkages between tractor and implement? (best option) OR Is the external 3-point linkage control at the tractor's rear located near the outside edges of the mud guards? (next best option)				
<input type="checkbox"/>	<input type="checkbox"/>	Is there limited, staged or slow activation for the external 3-point linkage control with STOP on release?				
<input type="checkbox"/>	<input type="checkbox"/>	Is tractor's drawbar lower than the axle, and does it have a suitable pin?				
<input type="checkbox"/>	<input type="checkbox"/>	Are a suitable hitch pin, lock and safety chain available for towing loads?				
<input type="checkbox"/>	<input type="checkbox"/>	Is the front-end loader equipped with a spear or grapple hook to secure large or unstable loads such as bales?				
<input type="checkbox"/>	<input type="checkbox"/>	Does towed equipment have a slow-moving vehicle emblem on the rear?				
Y	N	Safe Work Practice				
<input type="checkbox"/>	<input type="checkbox"/>	Do you hitch towed loads to the drawbar and never higher than the drawbar?				
<input type="checkbox"/>	<input type="checkbox"/>	Do you use counterweights for stability when towing heavy attachments?				
<input type="checkbox"/>	<input type="checkbox"/>	When using a front-end loader, do you travel with loader as low as possible?				
<input type="checkbox"/>	<input type="checkbox"/>	Do you ballast rear wheels to counterbalance the extra weight of a front-end load?				
<input type="checkbox"/>	<input type="checkbox"/>	When towing high loads, do you always check overhead power line clearance?				
<input type="checkbox"/>	<input type="checkbox"/>	Do you inspect equipment hydraulic systems for leaks, using cardboard and not your hand?				
<input type="checkbox"/>	<input type="checkbox"/>	Do you always lower mounted equipment before leaving tractor?				

Note: When older equipment does not meet the checklist's Physical Conditions, it is doubly important to follow the Safe Work Practices.