

# *Tractor Rollover*

## **Overview**

This station addresses tractor safety, with an emphasis on roll-over prevention and the use of ROPS. It contains a demo tractor, display board, and a curriculum.

## **Objective**

Educate audience about causes of tractor overturns, means of preventing tractor overturns, the importance of the ROPS to help protect the driver in the event of an overturn, and other potential safety hazards shown on the demonstration tractor.

## **Introduction**

- Introduce yourself to the students; let them know your name, background, and anything else they may be interested in that can tie into the presentation.
- Make students aware that the information you will present to them is very important, and that they need to pay attention.

Introduce the Topic of Tractor Safety

- Students all have their own stories and experiences to tell.
- If it is a relevant question, ask the students if they have had any experience with tractors before. Let students comment on this as time allows. Lead this comment into different questions, including:
  - What type of work do tractors do?
  - Are tractors powerful?
  - Can tractors be dangerous?
  - Have you ever driven a tractor?
  - Have you ridden along with someone on a tractor?
    - Where did you sit?
    - Was there a "seat" and a seatbelt for you to wear?
  - What is a ROPS? (Rollover Protective Structure)
  - Was there a ROPS on the tractor you drove/rode on?
  - Make sure these and other questions are age-appropriate. Use your own judgment and make adjustments as necessary.

## **A. Activity**

Materials Needed

- Tractor Rollover Display Board
- Tractor for Demonstration (some areas of this activity may not be possible if you do not have the 1/8 scale 4020 model tractor)

## Introduction

Introduce the topic of tractor safety and use the bar graph to show that the overwhelming majority of farm related fatalities are caused by tractors (147 from 1993-2002). Then use the pie chart to show that a majority of the fatalities caused by tractors are the result of a rollover (59%). This will alert the audience to the importance of tractor safety. You may continue on with the rollover facts; pointing out the percentages of side overturns and rear overturns.

## ROPS

Introduce ROPS by reading the ROPS Law and then use the model tractor to show the ROPS on the tractor. You may continue on with the What is ROPS section to help the audience understand what ROPS exactly is and to inform them that ROPS must go through testing to ensure that it will protect the driver. Make sure to point out that homemade roll bars and sunshades do not provide protection. You may then demonstrate how the ROPS protects the driver when the tractor is overturned using the model tractor. Make sure to point out the need for the seat belt to hold the driver within the protected area. This would also be a good place to talk about having a second person on the tractor. Ask the audience what they think could happen if there was a second person on the tractor. Since there is only one seat and one seat belt and second person would be thrown from the tractor and could be crushed.

## Causes & Prevention

You can now address the section on causes of tractors overturns. Go over each point and give as many examples of each if possible (ex. Mowing or bailing on the side of a steep hill, crossing a drainage ditch, driving through a road ditch). After you present the causes you may move onto the prevention of overturns. Make sure to go over the importance of wearing a seat belt again, as well as the importance of not wearing a seat if there is not a ROPS. If there is no ROPS and seat belt will hold you under the tractor and you will be crushed.

The Model (1/8 scale 4020 is necessary for this portion)

You may now use the other side of the display board to show some rollover hazards and point out the articles to help bring the issue closer to home. Then you may have the audience look at the model tractor and see if they can find some of the safety hazards on the tractor, such as, the damaged rim, bent steering wheel, damaged PTO guard, and the tools on the floor. You may also remove the ROPS before hand and see if the notice that as a safety hazard. The display also contains an undamaged PTO, rim, and steering wheel, you may use these to show what one in safe operating order looks like.

## B. Activity

### Materials Needed

- Tractor Rollover Display Board (Ramp)
- Small Tractors for Demonstration
- Hard Boiled Eggs
- Paper Towels for Cleanup

### Conducting the Demonstration

Sideways Overturns - Use the ramp and toy tractors to demonstrate how driving across a slope rather than straight up or down the slope will cause tractor rollovers. A higher center of gravity allows a side overturn to occur more quickly. The "Point of no Return" can be reached in 3/4 of a second.

Effect of ROPS - If possible, show the benefits of ROPS (Rollover Protective Structures) by performing a roll-over using a tractor with ROPS (cab or bar, with "seat belt") and one without ROPS. The visual impact of this demonstration can be enhanced if an egg (please use only hard boiled eggs for the demonstration) is placed in the operator seat.

### Other points to cover using the ramp for Rollover Prevention

- Avoid depressions and holes when going downhill..
- Avoid bumps, stumps and rocks when going uphill.
- Do not drive too close to a ditch bank.
- Use proper hitch points.
- Use caution while on steep hillsides.
- Avoid excessive speeds in turns.
- Added rollover danger with tricycle front end.
- Back *up* hillsides, and drive *down* hills

## Wrap Up

Go through these questions with students as time allows. Let them discuss the answers, and tie the presentation into their answers.

- Who in this group has ever driven a farm tractor?
- What age did you first drive a tractor?
- Do you know anyone who has been injured or involved in a tractor overturn?

Discuss once again the safety rules when working with tractors. Go through the following list with the students and make sure they understand why these rules are important.

When operating a tractor remember:

- No Seat, No Rider.
- Never start the tractor from the ground, always be in the seat.
- Keep tractor in good repair.
- Check lights and slow moving vehicle emblem.
- Make sure PTO master shield is in place.
- Securely fasten your seat belt if the tractor has a ROPS.
- Where possible, avoid operating the tractor near ditches, embankments, and holes.
- Reduce speed when turning, crossing slopes, and on rough, slick or muddy surfaces.
- Stay off slopes too steep for safe operation.
- Watch where you are going, especially at row end, on roads, and around trees.
- Be sure everyone is clear before moving.
- Operate the tractor smoothly - no jerky turns, starts, or stops.
- Hitch only to the drawbar and hitch points recommended by tractor manufacturers.
- When the tractor is stopped, set brakes securely and use parking brake if available. Remove the keys from the tractor.
- Train young persons to operate tractors properly, not only to physically manipulate the machine but to recognize hazards and know how to avoid them.
- No one should be allowed to ride in the bucket of loaders, on tongues between truck/tractor and the implement, or on any implement being towed.
- Terrain should always be taken into consideration when driving farm vehicles.