Safe Farm

Promoting Agricultural Health & Safety

Reduce farm accident risks on roads

It's late in the afternoon during fall harvest and you are hauling an empty wagon back from the elevator. Without warning a car hits your wagon from behind.

It's early June and you are hurrying to finish planting after a break in the weather. As you slow down to turn left into a field, a car trying to pass sideswipes your tractor.

Both situations are common in Iowa. The Iowa Department of Transportation (IDOT) records the number of collisions on public roads and right-of-way that involve farm vehicles. Collisions occur throughout the year, but are somewhat more common during fall harvest. Nearly half of all collisions involving farm vehicles occur from October through December in a delayed, drawn-out harvest.

The most common collisions occur when the approaching motorist hits a farm vehicle from behind (rear-end collision), or when a passing motorist hits a farm vehicle that is attempting to make a wide left turn (left sideswipe). These two situations each account for 22 percent of the total number of two-vehicle collisions in Iowa that involve a farm vehicle.

Although only a small percentage of vehicular injuries lead to a fatality, the National Safety Council and IDOT data show that a collision involving a farm vehicle is about five times more likely to produce a fatality than other types of motor vehicle accidents.

This publication discusses several reasons why these collisions occur, what make collisions involving a farm vehicle more likely to produce injuries and death than other types of collisions, and how to reduce your risk.

Differences in speed

When a farm vehicle is involved in a collision in the public right-of-way, there often is a large difference in the relative speed of the two vehicles. A passenger car traveling at 55 miles per hour approaches a tractor traveling in the same direction at 15 miles per hour at a rate of 59 feet per second. If the car does not slow down, it reduces the distance between itself and the tractor by the length of a football field in just 5 seconds.

Motorists can quickly come up on a farm vehicle unless they brake as soon as they see the farm vehicle. However, a car traveling at 55 miles per hour requires 224 feet of total stopping distance (for average reaction time and braking). Therefore, the driver of the car in the previous example would have only a few seconds to decide to slow down and avoid a collision with the tractor.

When the two vehicles collide, a rough measure of the amount of energy that must be absorbed by metal, brakes, bodies, etc., is the difference in the square of the two vehicles' speeds (if both vehicles are going in the same direction). If the two vehicles in the example collided with a 40 mph difference in speed (55-15), there would be 2,800 units of energy on impact (552-152). A collision of two vehicles traveling at speeds of 45 mph and 55 mph has only about a third as much energy on impact (552-452=1,000). When vehicles are traveling in opposite directions, energy increases.

Farm machinery safety

How much do you know?

1. How many injuries on Iowa public roads involve farm vehicles every year?
   a) 75
   b) 150
   c) 300
   d) 600

2. Name the two most common situations when two vehicles are involved in a farm vehicle collision.

3. Collisions involving a farm vehicle are _____ to produce a fatality than other types of traffic collisions.
   a) half as likely
   b) about as likely
   c) twice as likely
   d) five times as likely

4. A car traveling 55 mph is 100 yards behind a tractor traveling at 15 mph. How long does it take for the car to catch up with the tractor?
   a) 5 seconds
   b) 10 seconds
   c) 20 seconds

5. Which lighting and reflectors often are not well maintained?
   a) front
   b) rear

See answers on back.

IOWA STATE UNIVERSITY
Extension and Outreach

PM 1563E Revised March 2013

Unfamiliarity with vehicle outline

Non-farm motorists may not immediately recognize farm equipment on roadways or be aware of the special hazards they present. Lighting and reflector locations on tractors, combines, and other farm equipment are different from other motor vehicles. During either day or night, an unfamiliar vehicle outline may delay recognition of farm vehicles by the non-farm motorist. Loads on farm vehicles may be wider than other vehicles, which present special hazards for other motorists when left, right, rear, and front projections are not easily recognizable.

Poorly maintained warning signs

The slow-moving vehicle (SMV) emblem is recognizable to many non-farm motorists. It's important to maintain SMV emblems, as well as other reflectors, lighting, and equipment systems, to provide maximum visibility of farm vehicles to other motorists. A check of lighting and marking on 130 tractors and wagons during harvest at Iowa grain elevators showed that although front lighting (both white and amber flashing warning lights) was being well maintained, rear lighting and marking was often substandard. Because a common collision situation involves a second vehicle approaching from the rear, equipment operators should pay special attention to rear lighting and marking.

Not knowing operator intentions

Non-farm motorists may not understand farm equipment limitations, or see hidden field entrances. For example, the broad turning radius of many tractor-implement combinations requires operators to steer slightly to the right before making a wide left turn. Although a tractor operator may be using a left-turn signal, it may be hidden from the rear by another implement, or motorists may ignore the signal and think the tractor is turning right. The result is a left sideswipe of the farm vehicle by the non-farm motorist who is trying to pass the farm vehicle.

Ways to avoid accidents

• Make sure you're visible. Maintain existing lighting and marking on farm equipment. Clean reflectors, light lenses, and mirrors of mud, snow, ice, manure, or other debris before entering public right-of-way. Replace cracked lenses and burned-out light bulbs. Repair wiring if necessary to make lights operative. Replace faded SMV emblems. Maintain or add rear view mirrors to allow vision around the side of wagons or wide loads.

• Know the law. Become familiar with requirements of the Iowa Code and recommendations of the American Society of Agricultural Engineers (ASAE) for lighting and marking farm equipment (see other publications listed below). Consider installation of additional lighting and reflectors if equipment does not meet ASAE recommendations. Add marking and lighting to the rear of implements used on roadways and implements that obscure rear tractor lighting. If loads project more than 4 feet from the center of your vehicle, add reflectors or lighting to mark the extreme left and right projections.

• Drive defensively. All roadway travel is a team effort between yourself and other drivers. Do not assume that other drivers will see you pulling out of a driveway or anticipate your turn into a field. Allow plenty of distance before pulling in front of traffic. Assess alternate routes to the field and/or different travel times during which you can avoid high traffic. For example, can a morning chore schedule be changed to avoid roadway travel during a peak commuter time?

Prepared by Mark Hanna, extension agricultural engineer, and Charles Schwab, extension safety specialist.

For more information

This covers only some aspects of farm equipment transportation on public right-of-way. For more information, check out this publication:

■ Use SMV emblems for your safety, PM 1265J, from the Safe Farm series.

Farm machinery safety

What can you do?

- ☐ Inventory the condition of lighting, reflectors, and SMV emblems on farm equipment. Repair or replace as needed.
- ☐ Determine where additional reflectors, lights, and mirrors are needed for wide loads and those that obscure rear tractor lighting.
- ☐ Check with farm equipment dealers and suppliers about the availability and cost of additional lighting and marking.
- ☐ Change travel routes, if possible, to avoid times and locations of peak roadway use.
- ☐ When driving, be aware that traffic behind you will be trying to pass and may not anticipate your movements, such as a wide left turn.

Answers to quiz: 1-c; 2-rear-end collision and left sideswipe by passing vehicle; 3-d; 4-a; 5-b.

Safe Farm is an Iowa State University Extension and Outreach project helping to make Iowa farms a safer place to work and live.

For more safety information, check the web at www.abe.iastate.edu.

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Cathann A. Kress, director, Cooperative Extension Service, Iowa State University of Science and Technology, Ames, Iowa.