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Tractors + Traffic = Trouble

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Traffic+Tractors=Trouble

You're in danger each time you drive your tractor on the highway. Studies at Iowa State are helping to pinpoint some of the problems, their causes and possible solutions. Meanwhile, here are some tips for protecting yourself.

by **Norval J. Wardle**

“ALMOST like a sitting duck!” “Parked in a lane of traffic!” “Half blind and deaf!” Strong terms? Yes. But the facts bear them out. Necessary though it may be, you're in danger every time you drive a farm tractor onto the highway.

There were more than 3,000 accidents with farm tractors on Iowa roads from 1949 to 1959. There were 957 persons injured and 236 persons killed in these accidents.

This happened even though farm operators spend less than 5 percent of their tractor-operating time on public roads. The chances of having an accident with a tractor on the road are five times as great as in the field or yard. And, if there is an accident, the chances of its being fatal are over eight times as great on the highway as in the field or yard.

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The danger isn't confined only to major highways. More of these accidents occur on country roads than on the highways.

To help solve this critical problem, safety with tractors on the public roads has been under continuing study at Iowa State since 1955. Many road tests have been run to pinpoint the problems and their solutions. From these tests, certain practices have been appraised and adjusted for safety. And safety accessories have been developed and tested for their usefulness.

Out of this study and the road tests, the following suggested safety practices have been developed:

Protect Yourself . . .

If you must travel on a public road with your tractor, observe all traffic laws, including signals. Move onto the shoulder to let congested traffic pass, but never drive

with one wheel on the paving and one off. Equip your tractor with helpful and worth-while safety accessories.

A rear-view mirror is a big help to the operator. With a rear-view mirror you don't have to turn around to check the traffic behind you. Turning around and looking back leads to erratic steering; the tractor may overturn or go into the ditch if you try to correct the direction too quickly when you again look forward and see where you're going. To be most effective, a rear-view mirror should be:

—At least 5 by 11 inches in size to give you a wide range of vision.

—Securely mounted to reduce mirror jiggling to a minimum. A tripod-type mounting has been most effective in our tests.

—Adjustable from side to side, up and down and forward and

back. Telescoping arms with universal-type mountings accomplish this. These adjustments make the mirror helpful in field and yard work as well as on the road.

—Easily replaceable should it break.

A red and white warning flag alerts other motorists so they have time to stop if necessary. Such a flag should be:

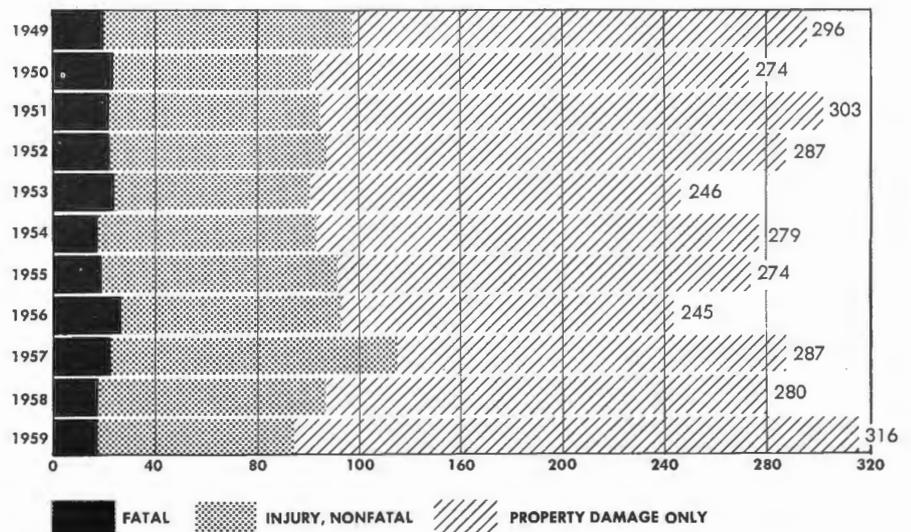
—At least 9 by 12 inches in size so it's readily seen at over 500 feet.

—Not over 16 by 20 inches in size. If the flag is too large, it doesn't wave easily in the breeze.

—Fastened to a staff by one edge. Then it will wave in the breeze and appear larger.

—Designed so that each color covers about half of the total surface. Single-color flags blend into much of the background. The best design is alternate red and white

Tractor Accidents on Iowa Roads, 1949-59



diagonal stripes about 3 inches wide (see photo, page 10). These are effective at 1,200 feet and more; stripes of less than 2½ inches are not easily seen over 300 feet away. Some checkerboard patterns also are easy to see (see cover photo).

—Mounted on a telescoping

staff so that it can be lowered out of the way for field work—yet be handy to raise whenever you're going onto the road.

—Mounted not over 2 or 3 feet above the head of the operator or the top of the machine. This height gives a warning from at least 400 feet away on Iowa's steepest hill roads. If higher, the flag isn't related to the tractor.

—Mounted at any convenient place that doesn't interfere with tractor operation.

A large red taillight and two good headlights, each easily seen from 500 feet away, are needed for night travel.

Red reflective tape of 3 by 6 inches size on the rear of the tractor, wagon or machine helps to warn motorists of a slow-moving vehicle ahead.

It's best, of course, to stay off the road at dusk or dark, and most Iowa farmers do this. In the past 11 years, less than 2 percent of the accidents with tractors occurred at dusk or dark. In contrast, over 30 percent of the accidents involving all types of vehicles occur at dusk or dark in Iowa.

How They Happen . . .

Tractor accidents on Iowa roads are a problem for all Iowans—and also for motorists passing



A rear-view mirror is an important safety device for on-the-road travel. With a mirror, you can determine the traffic situation behind you at a glance — avoiding the erratic steering resulting from the necessity of constantly having to turn around and look.

through the state. An average of 281 tractor accidents each year occurred on our roads from 1949-59 (see chart).

How do these accidents happen? The types of accidents that occurred are shown in table 1. About 88 percent of all the accidents involving tractors were collisions with another vehicle. The same figure for Iowa acci-



Some of the safety devices and practices suggested may help avoid this.

dents involving all types of vehicles was 78 percent for 1959.

Investigation of many of the accidents classified as "ran off roadway" and "other noncollision" has revealed that many of these resulted when the operator looked back to check the traffic. The tractor veered to the right, and, when the operator tried to correct it quickly, the tractor went off the roadway or even overturned on the roadway. Thus, it's clear that a major problem is to *alert* both the tractor operator and the operators of other motor vehicles to the presence of each other's vehicle while they're still a safe distance apart. (Tractor acci-

dents on Iowa roads that are not connected with other traffic are likely less than 2 percent of the total.)

The largest percentage of the *fatal* tractor accidents were "ran off roadway" accidents (see table 1). This was true even though only 8 percent of all tractor accidents were of this type. While less than 2 percent of the "collision with other motor vehicle" accidents were fatal, 54.6 percent of the "ran off roadway," and 41 percent of the "other noncollision" accidents were fatal. But many of the last two types were "traffic involved." This again points up the need for the tractor operator to see behind and forward all the time.

Another important need is to alert automobile and truck drivers to the presence of a slow-moving vehicle ahead. Because of the differential in speed, the drivers need to be warned of slow-moving tractors from a greater distance than if the tractor were another car. *Accidents that happen when the tractor and other vehicle are going in the same direction account for over half of all accidents.* The speed differential between the tractor and the other vehicle was critical in 84 percent of all the tractor accidents studied.

Over half of the drivers involved in the tractor accidents were reported as violating some Iowa road law. The types of violations were different for the drivers of different types of vehicles (see table 2). Tractor operators' main mistakes were: didn't have the right-of-way, not under control, and no or improper signal. Car and other vehicle op-

erators' main mistakes were: improper passing, not under control and following too closely.

Peak Accident Times:

The peak occurrence of tractor accidents on the public roads is in late morning (10-11 a.m.) and mid-afternoon (4-5 p.m.). Compared with the time of other types of accidents of farm people, the afternoon peak is about the same. The morning peak, however, is later—carrying on to noon with a relatively large percentage during the noon hour. This might be caused by traffic congestion on the road during the noon hour. The occurrence of tractor accidents drops off—especially after 7 p.m.—to practically nothing in the early morning hours. There is, however, an unaccountably large occurrence of tractor accidents between 11 and 12 p.m.

The number of accidents per month varies with the intensity of farming activity, especially when harvesting is involved. July and October are practically equal as the top accident months. Though the number of tractor accidents is low from December through March, travel on the roads may be more hazardous than during the other months when we consider the accidents on the basis of exposure.

The peak days for accidents are Tuesday and Saturday, though there really isn't a meaningful difference among the six work-days. Sunday is low in total occurrence, but this may also be high on an exposure basis when we consider the reduced number of tractors on the road on Sunday.

TABLE 1. Types of tractor accidents, and those which were fatal, on Iowa highways, 1949-59.

Type of accident	No. of accidents	No. of fatal accidents
Collision with other motor vehicles	2,704	50
Collision with a fixed object	27	5
Collision with pedestrians	6	2
Ran off roadway	262	143
Other noncollision	88	36
Total	3,087	236

TABLE 2. Six leading traffic violations related to accidents involving tractors on Iowa highways, 1949-59.

Type of violation	No. by tractor operators	No. by auto operators	No. by other operators (truck, etc.)
Didn't have right of way	443	105	30
Following too closely	21	219	53
Improper passing	25	328	113
No signal or improper signal	211	11	2
Not under control	271	253	67
Wrong side of road—not passing	99	74	22
Total	1,070	990	287