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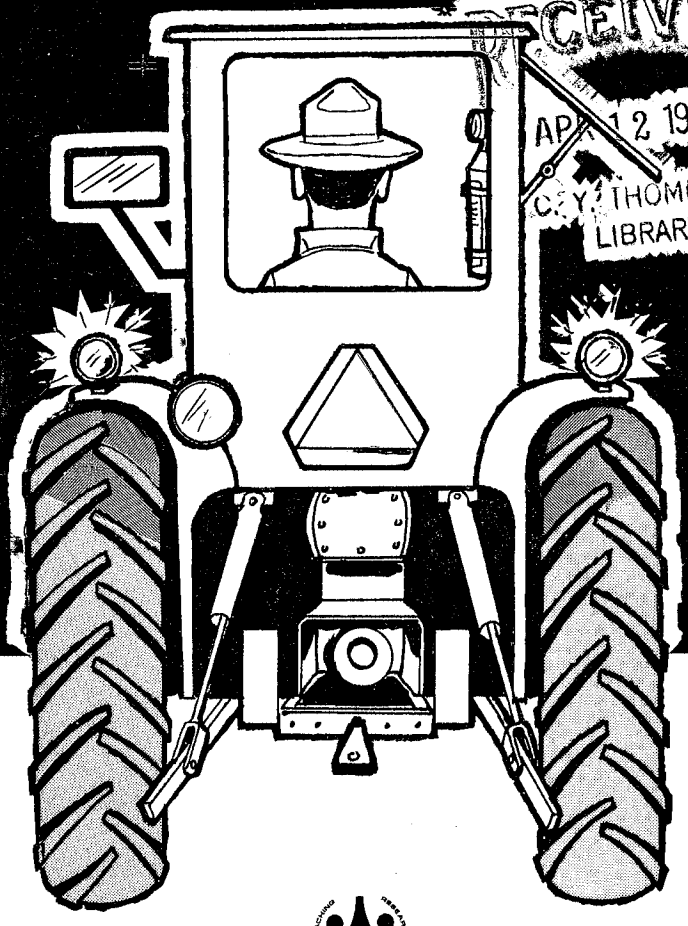
SAFE Tractor Operations



Extension Service
University of Nebraska-Lincoln College of Agriculture Cooperating with the
U.S. Department of Agriculture and the College of Home Economics
J. L. Adams, Director

Safe Tractor Operations

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No one deliberately has a tractor accident. Nevertheless, every year many farmers are killed or injured on, or because of, their tractors.

The causes of such accidents show that improper operation of the tractor or equipment accounts for the greatest percentage of accidents. Improper operation includes excessive speed, operator under the influence of alcohol and chasing cattle.

Other accident causes are driving on too steep an incline and inexperienced or immature drivers. Most accidents involving drivers under 20 years of age occur because of excessive speed. Most mishaps involving drivers over 55 are attributed to driving on excessively steep inclines.

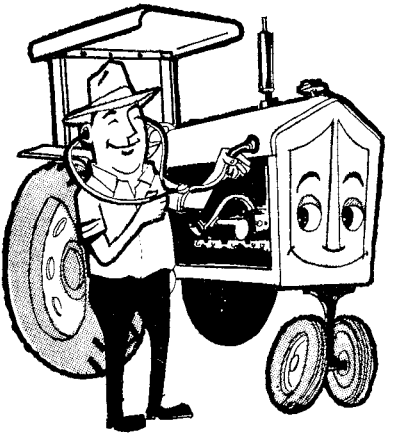
Farm people know the immediate pain and financial loss, and realize that permanent disability from tractor accidents causes continued hardship through medical expenses and loss of income.

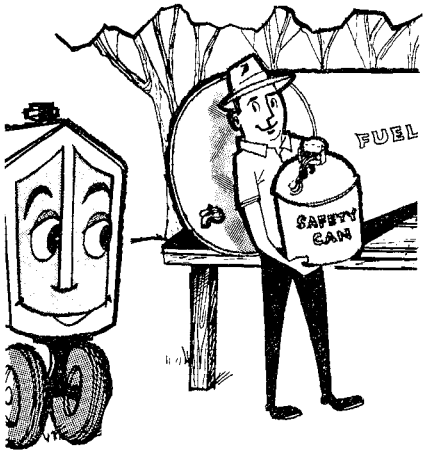
The most important point of tractor safety is to know your tractor.

Know how the tractor handles and be alert to meet all potential emergencies. Good educational programs are available for those who are willing to take the time to study tractor safety.

A good operator will read his tractor manual to become proficient in tractor operation. Next, he will practice these safety hints:

1. Be sure your tractor is properly serviced. Check lubrication, fuel and water. It is best to check the level of the radiator when the tractor is cold. If you must check it when hot, use extreme care.





2. Never refuel your tractor while the engine is running. Static electricity, a spark from the ignition system, or a hot exhaust could cause the fuel to ignite. Grounding out the tractor by use of a ground wire or by dropping mounted equipment so it contacts the ground can reduce the static electricity problem.

3. Always fuel your tractor outside and store your fuel outside. It's best to have fuel storage at least 40 feet from any building. Keep the area free of weeds or any other burnable material.

4. Carry a first aid kit and an approved dry chemical extinguisher. Tractors should have at least a five pound extinguisher.

5. Be sure of good ventilation before starting the tractor engine. Exhaust gases contain carbon monoxide which is odorless, colorless and deadly.

6. Keep small children away from tractors. Tractors are designed to carry only one person—the driver. Each year small children are killed as a result of falling from the tractor. The chances of being killed are just as great when they are allowed to ride on trailing equipment.

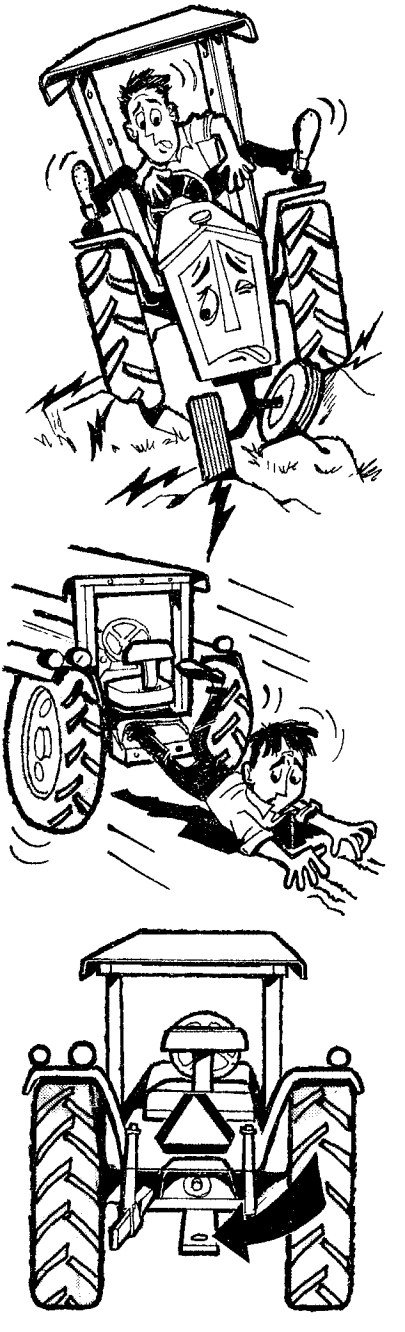
7. Keep wheels spread wide whenever possible. A tractor will overturn sideways much easier if the wheels are close together. When wheels must be moved in for narrow row farming, operators should use extra precaution when driving, especially when traveling at higher speeds on the roadways.

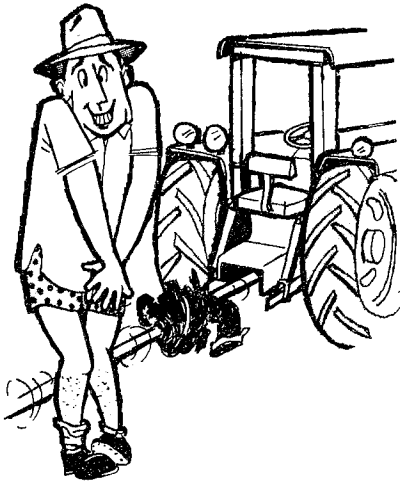
8. Reduce speed before turning. Doubling the speed of a farm tractor increases the danger of upsetting sideways four times. Centrifugal force tries to keep the tractor in a straight line. If you try to turn at a high rate of speed, the tractor will attempt to go straight forward rather than turn.

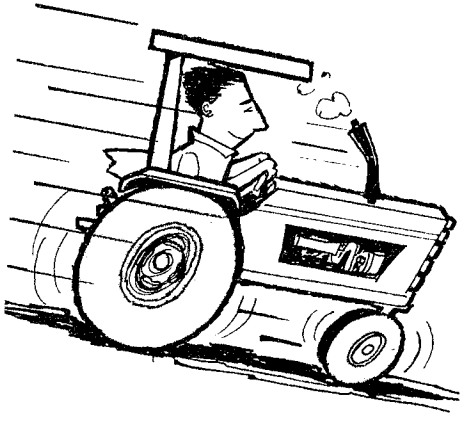
9. Reduce speed when using a loader. A loader in the raised position can increase the possibilities of overturns. Keep the loader as close to the ground as possible. Be alert for ditches, rocks or holes that might cause the tractor to overturn. The center of gravity can be affected if the load is kept too high in the air.

10. Stop the engine before you get off the tractor. Each year, people are killed as the result of being run over by a tractor. This occurs either when the tractor has been left running with the operator off the seat, or when it has not been put in gear, park, or had the brakes locked.

11. Never hitch to the axle or other high point. Always hitch to the drawbar, take up slack slowly and never jerk on chains or cables. Broken parts of a chain can act like shrapnel while a cable can cut the legs from under a person. Tractors can upset backwards when pushing, using a front end loader, or when hitched to the front end by chains or cables which pass under the back axle. Keep the hitch as low as possible, preferably 17 inches. Never get above a height of 21 inches.







12. Be extremely careful when driving up an incline. A tractor can upset if the center of gravity moves to a point behind where the rear wheels are in contact with the ground. Try and back up if it's necessary to get up the incline. If you get caught on a steep incline, back down very slowly and apply the brakes lightly. Weight on the front of the tractor will help in this situation.

13. Disengage the power take-off when it's not in use. Use the power shield whenever equipment is in use. If you do not have a pto shield, make one—it may save your life. Power take-off accidents can maim, cripple and cause death.

14. Do not wear loose, sloppy clothing while operating the tractor. Sloppy clothing can catch on moving parts and cause an accident.

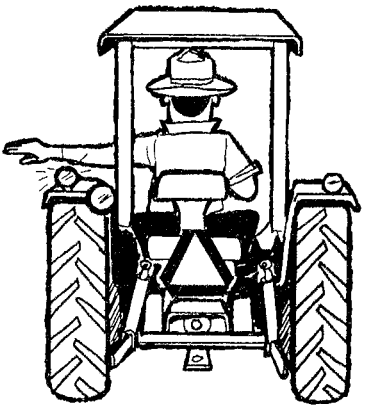
15. Keep the tractor in gear when going down hill. This allows the tractor engine to serve as a brake. It's against the law in Nebraska to coast down a hill with the vehicle out of gear. Some tractors may have "free wheeling" in their transmission drive. Make sure that this type of transmission is put in direct drive before attempting to use the engine as a brake.

16. Engage the clutch gently, especially when going uphill. Jackrabbit starts are dangerous to both the operator and the tractor.

17. Never attach a post or log to the rear wheels when the tractor is stuck in the mud. If the wheels are not free to turn, the tractor can pivot

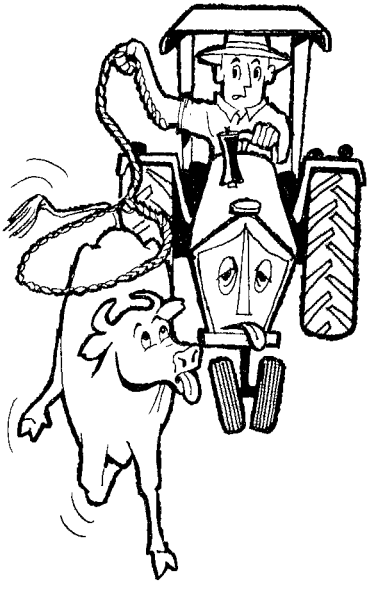
around the axle and upset. Try to back out if possible. If this does not work, get another tractor to pull you out. The time spent may be worth a lifetime.

18. The tractor operator must follow all rules of the road just as if he were driving a car. This includes such things as proper lighting, hand signals, and right-of-way. Tractors are restricted from using the Interstate Highway system. Tractor operators should get a copy of the Nebraska Statutes and become familiar with those dealing with tractors in traffic.



19. Do not use a tractor for a job for which it wasn't designed. The tractor was designed as a source of power to do field work. It was not designed for chasing cattle, drag racing, or as a means of transportation to and from towns.

Driving on highways can be dangerous.



Nebraska law requires the Slow Moving Vehicle Emblem to be used both day and night on slow moving equipment which use the state roadways.

In addition, there shall be two white lights for use when there is not sufficient light to see objects 500 feet ahead of the tractor.

Furthermore, there shall be a red light on the rear which easily can be seen up to 500 feet away under normal atmospheric conditions. Newer tractors are coming out with either one or two amber lights on the rear which may blink or be a solid light depending on the state laws. Nebraska allows either type to be used.

Since 1956, 2,814 accidents involving farm equipment on highways have been reported to the Nebraska Accident Records Bureau. Most of these accidents have involved farm tractors colliding with motor vehicles, running off the road or overturning (Table 1).

Table 1. Accidents involving farm equipment on Nebraska roadways.

Year	Total Accidents	Fatalities	Injury
1956	83	5	30
1957	112	10	38
1958	128	13	52
1959	142	8	51
1960	192	8	49
1961	170	9	55
1962	162	10	57
1963	166	16	55
1964	117	3	45
1965	170	11	61
1966	170	10	56
1967	167	10	67
1968	145	6	54
1969	163	11	51
1970	151	7	45
1971	164	15	50
1972	200	15	59
1973	212	11	69

The 2,814 accidents resulted in 178 fatalities and 944 injuries. Some of the injuries caused permanent disability while some were only bruises.

It is also important to note that in some situations tractors caused accidents between other vehicles even though they were not involved themselves.

Much of the increase in accident numbers is due to the growth in automotive travel and the increased use of farm equipment on highways. The number of farms has decreased while the size of farms has increased. Consequently, the farmer is now travelling more miles on the roadway.

The 1954 Census of Agriculture showed 89,509 farms and 163,284 tractors. In 1973, there were about 200,000 tractors on 70,000 farms. The number of tractors on farms increases each year since farmers are buying newer tractors and using some of the older ones for special farm jobs. In addition to tractors, there are approximately 50,000 self-propelled vehicles such as combines, balers, ensilage cutters, etc.

Many of the tractor accidents which happen on the open road and result in death are single accidents caused by excessive speed, improper turning, dropping wheels off the roadway and other acts of carelessness.

Table 2 shows the number of persons (by age groups) who have been killed in tractor accidents on Nebraska farms from 1955 through 1973.

Table 2. Number of persons killed (by age group) in farm tractor accidents. 1955 - 1973

	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70+	Total
1955	2	0	2	1	1	0	1	1	2	1	4	2	2	1	1	21
1956	1	0	0	1	0	4	0	0	0	3	1	3	6	1	4	24
1957	1	0	1	1	0	2	0	1	0	3	1	9	1	4	3	27
1958	1	0	4	0	2	4	0	4	3	4	3	2	5	3	2	37
1959	2	1	2	1	1	1	0	1	2	2	3	5	1	3	2	27
1960	0	1	0	1	0	1	1	0	0	2	2	3	6	4	6	27
1961	2	1	2	3	1	2	3	1	4	2	4	3	6	6	2	42
1962	2	1	3	1	0	1	1	1	3	2	4	3	2	4	2	30
1963	3	1	2	1	3	4	0	1	2	9	3	3	4	6	7	49
1964	3	0	3	2	4	0	0	1	1	4	3	4	3	1	1	30
1965	0	2	0	1	2	0	0	1	0	0	0	3	4	4	11	34
1966	3	1	2	1	1	2	2	2	3	3	3	2	5	1	4	35
1967	1	1	3	2	0	1	0	0	0	1	3	3	2	2	6	25
1968	2	0	5	1	1	1	1	4	1	1	0	2	4	4	3	30
1969	1	1	3	1	1	1	0	4	0	0	1	4	5	2	5	29
1970	2	1	4	2	1	2	2	0	0	2	1	2	1	2	3	25
1971	2	2	10	0	0	1	1	2	2	1	0	5	3	1	6	38
1972	0	0	0	3	3	2	3	2	2	0	0	2	4	3	2	26
1973	1	0	2	2	4	3	0	0	2	2	1	1	4	5	5	32

No age range is immune to death from tractor accidents. Although we are concerned about the youthful age of some drivers, we should also be concerned about the older driver—especially since many accidents happen to those in the over-50 age group.

One reason for the high fatality rate is the use of many older persons as tractor operators during cultivating, harvesting, and plowing. In many instances they are not familiar with the equipment they are using.

The type of tractor you operate may have some effect on tractor safety.

A recent Nebraska study showed that 60% of the tractor overturns occurred to tractors with narrow front ends. One hundred forty eight of the 175 tractors involved in the study overturned sideways. Fatalities were not too common where the overturn was limited to 90 degrees. Cabs or roll-bars usually restrict an overturn to 90 degrees. If the overturn goes to 110 degrees, the cab or roll-bar still gives protection. No lives were lost, according to the study when the overturned tractor had a cab or roll-bar. The operator should not assume that all cabs will give protection. Some are not strong enough to withstand an overturn.

The study showed that although sideways overturns occur more frequently, the backward overturns are more apt to be fatal. It also concluded that fatal tractor accidents are more apt to occur in fields or pastures while injury accidents are more likely to occur on public roads.

When tractors are used carelessly or improperly, they can be dangerous. Have your dealer explain the use of the machine you purchase. The Nebraska 4-H program has a tractor driving project which covers instruction on maintenance, operation and safety. This program also includes county, state and regional tractor driving contests.

In addition, County Agents and Vocational Agriculture Instructors, with the help of machinery dealers, have worked together in presenting tractor operation schools for boys and girls who are interested in summer employment on farms.

Tractor accidents can be avoided. You can be a safe operator if you know the limitations and capabilities of both you and your tractor. Above all, use common sense. It doesn't pay to hurry.

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