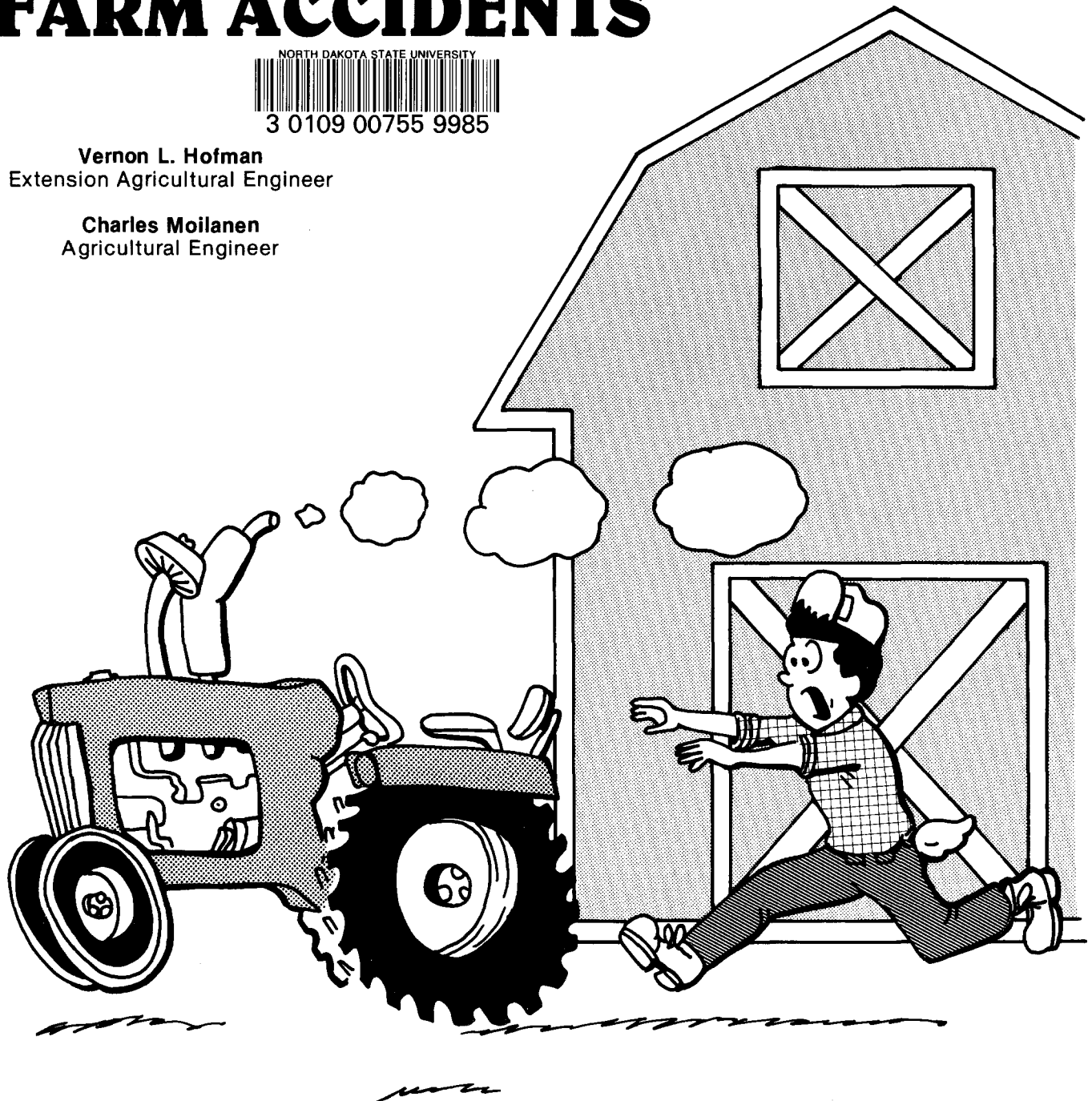


How to Eliminate or Reduce **FARM ACCIDENTS**



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Agriculture is one of the most hazardous occupations in the United States. The National Safety Council estimates that every year, nationwide, 1,700 farm workers die and 170,000 are injured. This is roughly 16 percent of all occupational deaths and 9.4 percent of all occupational injuries in the United States, even though less than 3 percent of the work force is employed on farms.

Probably the most agonizing statistics relate to farm children. Researchers estimate that as many as 300 farm children die and another 23,000 are injured yearly with many of the accidents occurring in the two- to five-year-old age group.

North Dakota's primary industry is agriculture and approximately two-thirds of North Dakota's annual gross product is derived from this industry. In 1985, more than half the work-related deaths in the state resulted from agricultural accidents.

Farm accidents are expensive and traumatic. Medical fees, property damage, lost productivity, higher insurance rates, and legal fees can cost an individual thousands of dollars.

Family life disruption, pain and suffering, and serious reductions in quality of life resulting from accidental injury and death are "costs" that cannot be measured in dollars and cents.

Farmers must place accident prevention on the same level as other management factors affecting productivity. If they make a serious and concentrated effort to reduce or eliminate accidents, their returns in time and dollar investments will be higher and the waste of human resources will be significantly reduced.

Most companies involved in manufacturing and production make accident prevention an integral part of the management and decision-making process. In most companies, a set of safety rules are produced and followed by all workers and are a part of the operation.

Accidents are unplanned events. Factors causing accidents are no mystery.

Every accident has three major components:

1. **The human factor.** A person's age, physical and emotional state, knowledge of work hazards and proper work procedure are all part of this accident component.
2. **The source of injury.** The source may be chemicals, machinery, toxic gases, tools, ladders, slippery work surfaces, or anything that can injure or kill an individual by striking, burning, cutting, poisoning, or catching.

3. **The environmental factor.** Terrain, weather conditions, lighting, time of day, proximity and many other related factors all can have an influence on accidents.

The interaction of these three elements is the basis for every accident. Since accidents cannot happen without the involvement of these factors, they must be identified, studied, and controlled to reduce risks.

Safety is a matter of attitude, 24 hours a day, seven days a week. The development of safe working habits must be a part of every activity. It is this awareness and the consequential good habits that are developed that constantly remind us of the dangers associated with life.

A survey of farm accidents in North Dakota was conducted from October 1, 1979, through September 1980. For this survey 14 counties were randomly selected to represent a cross section of the farming activity of the state. (This survey was published in October 1982 titled "Farm Accidents in North Dakota" by Robert Fanning.)

In November 1987, a thesis was written as part of a master's degree program in agricultural engineering entitled "A Study of Two North Dakota Accident Surveys, and Deaths from North Dakota Farm Accidents 1970-1985." These surveys of farm accidents were conducted according to a procedure designed by the National Safety Council. The compilation of farm related fatalities was assembled with the cooperation of the Division of Vital Statistics, North Dakota State Department of Health.

Tables and graphs taken from the two sources are used to highlight the seriousness of the safety problem and to help farmers identify those areas in their particular operation that need close attention.

Figure 1 shows accidents by family members and illustrates the fact that a large percentage of farms are family operated.

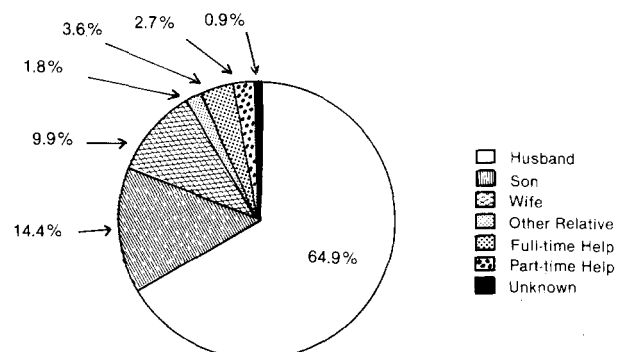


Figure 1. Accidents by family members.

For farms that are operated and managed primarily by the family, the operation and management becomes a major part of the family's lifestyle. This leads to a feeling of security not found at industrial sites. This feeling usually persists until a major accident occurs or a family member is killed.

The doorway in the home leading to the farmstead should have a sign indicating that you are now entering the work area and safety is extremely important. A large percentage of accidents occur in places where the farm worker spends a good deal of time, such as the yard or in farm buildings. In most cases, accidents don't just happen. Accidents result from a pattern of careless conduct that develops over a period of time, and then one day a combination of circumstances are present and an accident results.

Figure 2 shows that a large number of accidents occur in the 25 to 65 age group. Workers in this age group need to look at their daily conduct and identify the hazards associated with their daily efforts.

Many accidents occur when the worker is preoccupied with serious problems or unnerving events. Extra mental preparation must be made by the worker for a safe work day under these circumstances. On some occasions it may be better to take the day off regardless of the urgency of the work. The younger worker will require training and close supervision to develop safe skills.

March, April and July are among the peak months of farming activity and show the highest occurrence of accidents (Figure 3). Many accidents are caused by haste and by the variation of machinery use. A good safety procedure when machinery use changes would be to review safety precautions in that machine's operator's manual. If the manuals become unreadable for one reason or another, most manufacturers and implement dealers will be able to replace them. Each farm operator should recognize that these months are extremely hazardous and should detail a program to review activities that require special safety precautions.

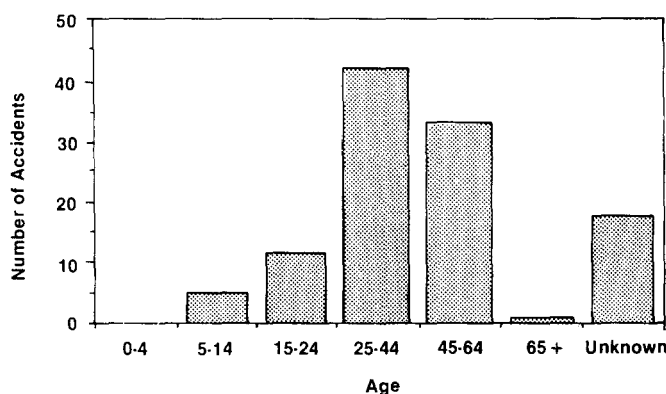


Figure 2. Age of accident victim.

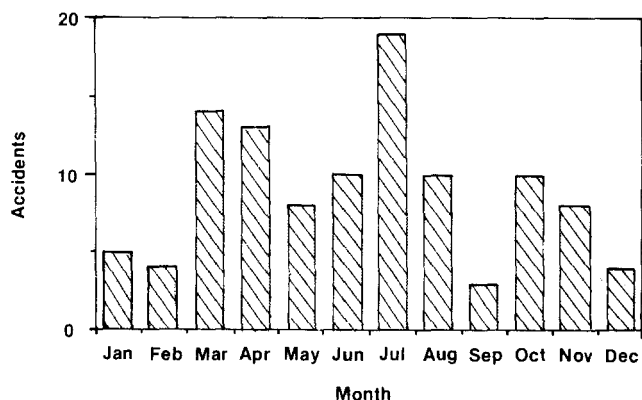


Figure 3. Month of accident occurrence. (Based upon the 111 accidents reported in the survey.)

The frequency of the type of injury reported and the part of the body injured should help the farm operator develop an awareness of the hazards associated with a particular activity (Figures 4 and 5).

Figure 4. Comparison of North Dakota and national survey results by type of injury.

Type of Injury	North Dakota 1980 & 1985	National (31 states) 1972-1982
Sprained or strained	23.5%	15.5%
Cut or laceration	18.0	23.2
Fracture	12.6	16.1
Bruise	9.9	12.6
Eye injury	7.2	5.5
Puncture	5.4	5.7
Crushing	4.5	0.0
Asphyxiation	2.7	0.1
Amputation	1.8	1.5
Burn	1.8	2.2
Mangled	0.9	1.4
Pinched	0.0	1.6
Multiple	0.0	6.0
Other	11.7	8.6
Total	100.0%	100.0%

Figure 5. Comparison of North Dakota and national survey results by part of body injured.

Part of Body	North Dakota 1980 & 1985	National (31 states) 1972-1982
Finger	13.5%	12.6%
Foot or ankle	12.6	11.5
Leg	12.6	13.3
Back	9.0	9.9
Eye	9.0	6.1
Hand or wrist	9.0	9.2
Arm	8.2	8.2
Head except eye	4.5	6.9
Neck	3.6	1.0
Chest	2.7	3.3
Shoulder	2.7	2.6
Stomach and intestinal area	2.7	1.0
Toe	0.9	1.5
Genitals	0.0	0.1
Multiple	0.0	6.8
Other	9.0	6.0
Total	100.0%	100.0%

Causes of accidents are varied, but agricultural machinery and livestock cause the majority of injuries (Figure 6). Particular attention must be directed to these areas to identify unsafe practices.

Figure 6. Comparison of North Dakota and national survey results by type of work being performed.

Type of Work	North Dakota 1980 & 1985	National (31 states) 1972-1982
Machine maintenance	28.0%	12.7%
Handling livestock	20.7	9.5
Routine chores	13.5	25.4
Farm building maintenance	8.1	6.7
Field work	8.1	21.1
Operating or riding machinery	8.1	0.0
House work	0.0	2.3
Yard work	0.0	3.1
Other activity	13.5	24.4
Total	100.0%	100.0%

Figure 7 shows the location and frequency of accidents as a percentage of the total. This gives the farm operator a good idea of the serious hazards needing attention.

Figure 7. Comparison of North Dakota and national survey results by location of accident.

Location	North Dakota 1980 & 1985	National (31 states) 1972-1982
Farm yard	29.7%	18.3%
Farm building	18.9	12.4
Field or cropland	15.3	19.9
Barn	9.9	14.9
Public area	2.7	1.0
Pasture, range or woods	2.7	8.2
Driveway	1.8	5.1
Road, county or township	1.0	3.1
Yard or garden	0.0	5.1
House	0.0	3.4
Pond or stream	0.0	0.3
Other location	18.0	8.3
Total	100.0%	100.0%



Most accidents can be prevented if safety procedures are practiced in all farming operations. Safe work habits and safety awareness are aspects of a worker's activities that must be constantly watched.

Fatalities occur during any month of the year (Figure 8). The peak months are those of increased activity, April through October.

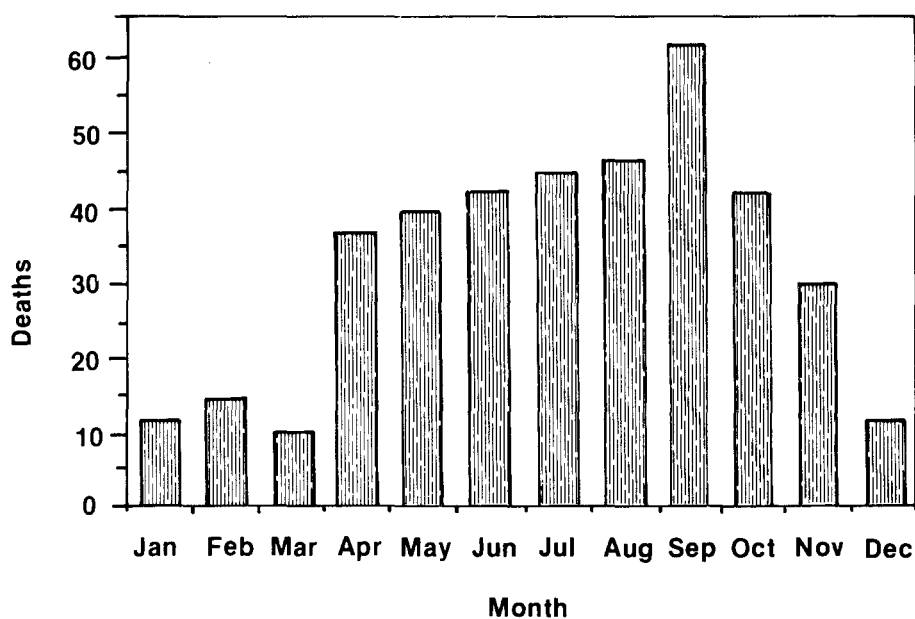


Figure 8. North Dakota farm deaths by month, 1970-1987.



People of all ages can be killed in farm accidents (Figure 9). Probably the most painful statistic is the death toll for ages zero to five. The high number of deaths in the under five age group is due mainly to runovers and extra riders. Young children enjoy riding on a tractor, but many times the unexpected happens and the child falls off. Only one seat is provided on tractors, which means there is only room for one person.

Because of the nature of a family operated farm, small children are allowed in hazardous areas. This would not happen in an industrial setting as it would be illegal. Play areas near the house should be fenced and watched regularly. Young children should be allowed in the work area only when accompanied by an older person. In the days of horse drawn machinery, the play areas for children were well protected as no one knew when horses and machinery might enter the farm yard without the driver — usually at high speed. This safety precaution, as noted from the statistics, may have changed, but is not outdated because of changes in the power source.

The large number of deaths to those between 16 and 25 is probably due to a lack of experience. A strong training program for safe operation of farm machinery should be a part of every farm operation. A good safety training program will require constant attention to be sure that the hazards are identified and avoided.

The number of deaths in the age category of 56 and older is largely due to a gradual deterioration of physical condition. In many older people, sight and hearing impairments are not readily recognized because of the way in which they happen. Physical dexterity and capability are much lower than a younger person. Unfamiliarity with the operation of new and more complicated machinery can contribute to possible unsafe operation.

Recently, an older farmer ran over and killed his wife with a farm truck because his eyesight was poor. He didn't see her. In these situations, greater caution will reduce fatalities.

For the age group between 21 and 55, the safety program must become a part of planning and management. Safety awareness is not necessarily automatic but requires serious effort and constant attention.

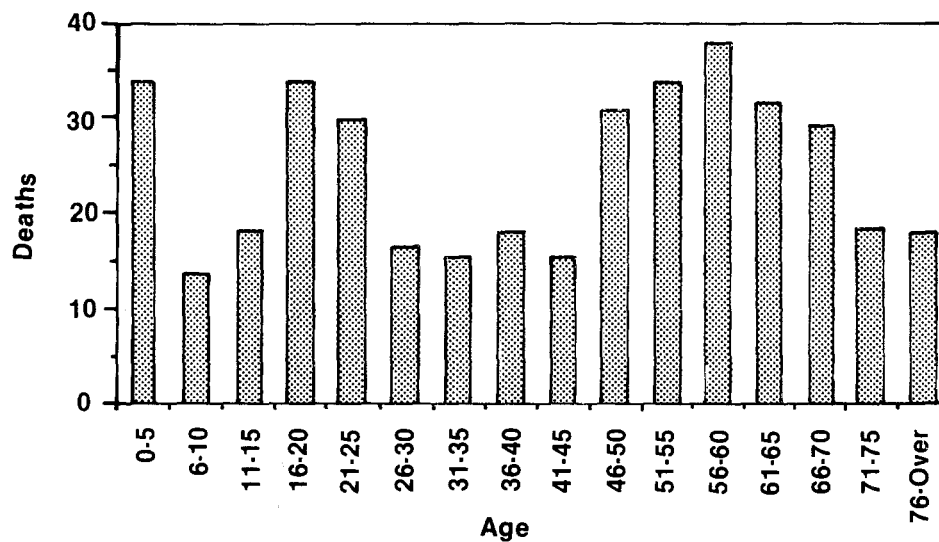


Figure 9. North Dakota farm deaths by age, 1970-1987.

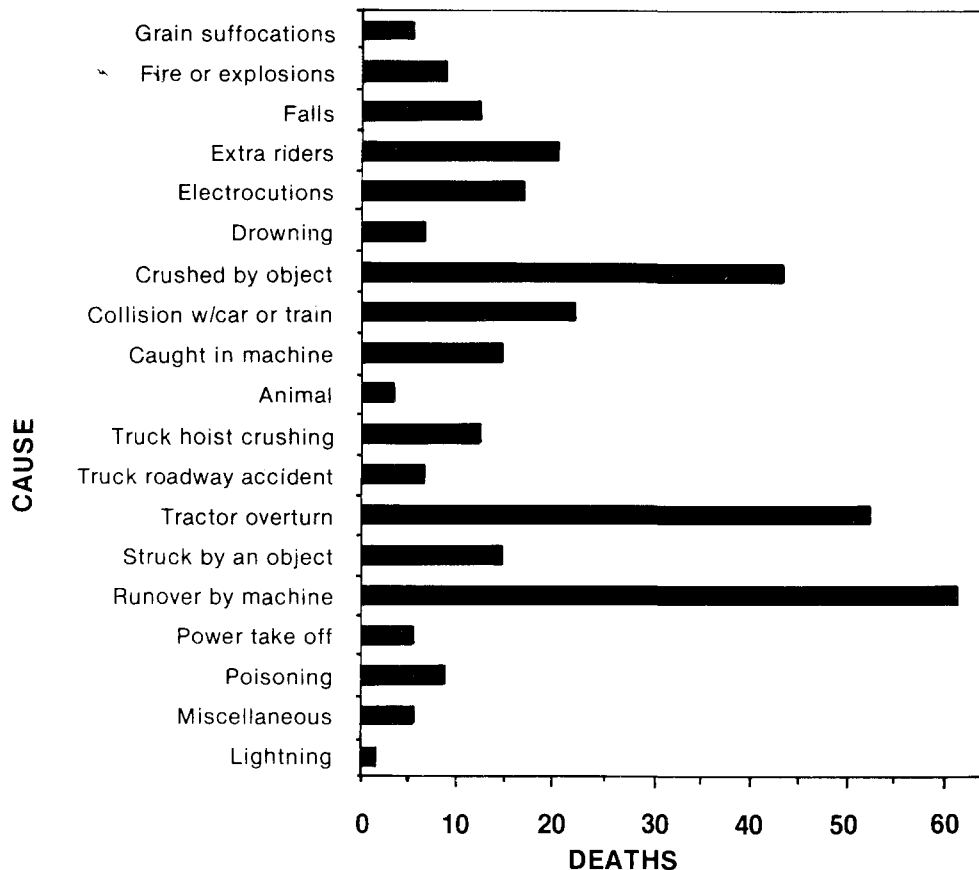


Figure 10. Cause of death in North Dakota fatal farm accidents, 1970-1987.

That cause-of-death chart (Figure 10) highlights those areas that need the most attention to promote good safety awareness. Being run over by a machine, tractor overturn, and crushed by an object are frequent accidents. All cause significant numbers of deaths. All accident areas need to be included in an effective safety program.

Since tractor overturn fatalities have a high incidence, serious thought should be given to installing a rollover protective structure (ROPS) on older tractors. Be sure it is ROPS certified. A makeshift rollbar may be worse than nothing at all as a false sense of security may be instilled in the operator.

All operators should be trained to properly operate the tractor and machinery they are using. Hitching the tractor to equipment should be done using recommended procedures. Carefully study all safety suggestions included in the equipment operator's manual.

Develop a good safe pattern of activities and follow it. Many mistakes are made in activities when for one reason or another a previously well developed routine is suddenly changed.

Farm operators must look at their operation and make a list of hazards that can be controlled or removed. "Hazard hunts" should be conducted on a regular basis. Checklists are available from the National Safety Council Agriculture Department. The farm operator should also be aware of local, state and federal health requirements.

For assistance in developing a safety program, contact your local county extension office for safety information and publications.

Thanks are given to all NDSU Extension Service staff and the many volunteers who assisted in gathering data of farm accidents.

Special thanks are extended to the Division of Vital Statistics, North Dakota State Department of Health, for their assistance in providing information on farm fatalities.

Figures taken from "A Study of Two North Dakota Farm Accident Surveys and Deaths from North Dakota Farm Accidents 1970-1985," a thesis submitted to the Graduate Faculty of the North Dakota State University of Agriculture and Applied Science by Robert W. Fanning, November 1987.

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