OCCUPATIONAL INJURIES IN AGRICULTURE: A 35-STATE SUMMARY

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Introduction

The National Safety Council's farm survey data base represents a unique resource for research on farm-related injuries. It contains general descriptive data about the "who, what, when, where, and how" of injuries sustained by persons who lived or worked on farms. It contains detailed data on the circumstances of selected farm injuries. It includes data on all injuries to farm residents, whether work-related or not. It also contains estimates of the number of hours farm residents and their hired help were exposed to farm work and its attendant hazards.

The depth of detail on injury circumstances was achieved by using bi-level forms to collect the data. Recht (1970) and Hoskin (1978) described bi-level reporting as a way to resolve two conflicting goals in injury research: the desire for in-depth information versus the need to minimize the burden of data collection. The concept of bi-level report forms and its application in this situation are discussed in greater detail in the Method section of this report.

This data base also provides a rich source of research information because of the breadth of its coverage. It records the injury experience of 127,169 family members and 57,301 full- and part-time employees on 37,293 farms in 31 states. More than 5,753 injuries are described in the data base, from relatively minor recreational injuries occurring to children living on farms to permanently crippling or fatal occupational injuries. Of the total injuries, 4,105 or 71 per cent were occupational injuries.

The Council's farm injury data base has been used extensively to support farm and ranch safety. It has been used to document the magnitude of the farm safety problem (National Safety Council, 1978); to describe the general characteristics of farm-related injuries (Hanford & Conrath, 1972; Hanford, 1976; Hanford, Burke, Fletcher, Recht, Hoskin, & Miller, 1979; and Hanford, Burke, Fletcher, Hoskin, & Miller, 1982); and to describe the

characteristics of specific problem areas such as farm animals (Hoskin & Miller, 1979), and dairy production facilities (Hanford & Fletcher, 1983b). It has also been used to respond to hundreds of requests for information on farm safety problems from students, lawyers, extension safety specialists, farmers, researchers, and the general public.

This report serves two purposes: it summarizes the occupational injury data now on file from 35 surveys in 31 states (four states repeated the survey), and it examines some potential intervention measures for specific injury scenarios identified from the data. The data summary covers all of the major areas of interest--the farm; the injured person; the injury event; the environmental conditions; the location; the activity and action of the person involved; and the costs, time lost, and rehabilitation needs. The exposure data was used to compute work injury frequency rates by age, sex, and employment status. Crosstabulations were used to construct injury scenarios, i.e. short descriptions of the most frequent combinations of characteristics which define a common injury pattern. The scenarios were then examined to identify possible intervention measures based on the commonly accepted prevention techniques of engineering, enforcement, and education.

Two related analyses of the farm survey data were performed in conjunction with the work reported here. One was an in-depth analysis of the survey data on tractor-related work injuries, including a comprehensive literature review and suggestions for interventions (Hoskin, Miller, Hanford, & Landes, 1988a). The other report deals in a similar way with agricultural machinery-related injuries (Hoskin, Miller, Hanford, & Landes, 1988b).

To prepare a foundation for interpretation and discussion of the results of this analysis of the Council's general farm survey data base, we first present a summary of the research on farm injury problems. The summary first discusses some of the unique problems associated with the farm work environment, farm injury research and injury control. Then a summation of the results of

research studies deemed to be relevant and of high quality, grouped by the scope of the data collected, is presented.

Literature Review

In modern times, farming has been recognized as a unique work environment with distinct differences from other industries in terms of work place, work force, work routine, health requirements, and emergency medical services (Knapp, 1965). In nonfarm occupations, work and home are usually in separate locations. For farm workers, they are usually the same location. Whereas in industry management and labor are separate, the farmer is both.

Farm workers are not limited to adults, but often include the very young and very old, either paid or unpaid family workers. There is no regulation 40 hour week but rather a highly erratic tempo dependent on weather, season, and climate. Often, the farmer is forced to work in heat, wind, snow, rain, cold, or at night (Saran, 1978).

As opposed to the specialist in industry, with a high degree of expert instruction, a farmer is a jack-of-all-trades who is often self-taught by trial and error. He usually works alone, far from assistance if an accident does occur. Emergency medical services are often great distances from the farm location.

Field (1980) discussed the various physiological stresses the farmer is likely to face from his environment such as fatigue from other activities, physical ailments, and environment, and also outlined psychological demands the farmer is likely to face. These include financial pressures, deadlines, concern over weather uncertainties, and boredom from long hours of work or repetitive tasks.

With the pressures of this unique work environment, unfortunately, come special hazards. Of the eight major industry divisions grouped according to standard classifications, agriculture had the highest death rate in 1986--52 deaths for every 100,000 workers, excluding deaths of persons under 14 years of age (National Safety Council, 1987). Besides agricultural production, the agriculture industry division also includes agricultural

services, forestry, fishing, and hunting and trapping. However, these industries accounted for only about 30 per cent of all agricultural workers in 1987.

The hazards that have been recognized in agriculture have prompted a wide variety of efforts to gather farm accident data. However, the unique conditions in which the farmer operates and which present special hazards to him are often the same conditions which thwart data gathering efforts. The absence of the regulation of a traditional workplace brings certain freedoms, but is unfortunately accompanied by the lack of a convenient mechanism for injury surveillance and countermeasures.

Efforts to collect and analyze farm accident data can be categorized in several ways. They are either national in scope or limited to one state. In most instances, they rely either on fatality information from vital statistics records, or injury information from workers' compensation or hospital records. A special class of efforts are those epidemiological studies which attempt to survey a subpopulation of farmers regarding the death and injury experience of their families and their hired workers. A review of these studies will give the reader some background in which to place this current analysis.

National Data Bases

Disregarding for the time being data bases from surveys, national data bases are very limited in number. During the mid 1970s, workers' compensation data for agricultural workers covered by such laws in various states were collected by Burkart and deGroot (1975). This study identified over 84,000 case records in six states and Puerto Rico, and a second study (Burkart, deGroot, & Wolfenson, 1976) expanded the data base to eight states and 129,000 cases. Although these studies identified common accident and illness types and agencies involved, the authors were careful to delineate the limitations of workers' compensation data, namely, incomplete coverage, lack of record detail, coding incompatibility,

underreporting, and reporting errors.

The most serious difficulty with analyzing data collected from workers' compensation authorities was that differences in collecting and coding data by various sources made the task of combining data very risky. As a result, state data were analyzed separately and compared, so that the data bases reverted to a series of state level analyses rather than a true national data base.

The researchers noted certain patterns common to most states, however. These included the preponderance of accidents to males over females, the large number of injuries to younger workers, and seasonal accident trends. The most common accident types were struck by or against, overexertion, falls, and caught in or between objects, and the most common injury types were cuts, burns, strains, and fractures. The usual parts of body affected were backs, fingers, and eyes.

The most common agency of accident was working surfaces followed by vehicles, tools, animals, machines, containers, wood items, plants, metal items, and toxic substances.

One other source of farm data on a national scale is the National Center for Health Statistics (NCHS). Information is available from NCHS for all deaths in the U.S. tabulated by location of death, with farm as one of the location values. This data base was investigated by Fritsch (1976) and Fritsch & Zimmer (1980).

As of 1976, machinery (including tractors) accounted for over 26 per cent of the deaths each year identified as occurring on farms. An additional 19 per cent were from striking against or by an object, and 12 per cent were drowning. The researchers also devised a framework for separating these deaths into work and nonwork based on information about accident type, age, and other variables. Of the 1,438 fatalities in 1976, a maximum of 1,076 were found to be work related.

One major consideration which was noted by the researchers was that deaths tabulated by place in this manner necessarily exclude deaths to farmers in the farm home and on public roads, many of which may be work related. Updated data from the National Center for Health Statistics regarding nontransport deaths on the farm is published annually by the National Safety Council (1987).

Recently the National Institute for Occupational Safety and Health (NIOSH) has become a source of agricultural mortality data on a national scale (NIOSH, 1987). In an ongoing program, death certificates for those persons aged 16 years or older with a positive response to the "injury at work" item on the certificate and with an external cause of death, are acquired from all states and the District of Columbia. Several variables are included in the data base including dates of birth and death, state of death and residence, location, description of injury, immediate, contributory and underlying causes of death, industry, and occupation.

Of the 6,901 average annual traumatic occupational fatalities collected using this method for the 1980 through 1984 periods, 707 were specifically identified as occurring in the agriculture industry division. This figure is not an estimate of accidental work deaths because it includes homicide and suicide deaths from certain reporting states. It should be considered a lower bound since 1,358 fatalities out of the 6,901 total could not be classified by industry and since an estimated 414 additional homicide, suicide, and pending deaths were not reported.

Death certificates alone are not a complete source of occupational fatality data. Karlson and Baker (1978) showed that death certificates identified about three fourths of the work-related deaths in Wisconsin, and Baker, Samkoff, Fisher, and Van Buren (1982) found that no more than two thirds of work-related deaths in Maryland were identified by death certificates. In addition to the certificates with a positive response to the

"injury at work" item, there are certificates with no response to the question--some of these would undoubtedly be work-related. There are also those deaths which are actually at work, but where the work association was missed by those completing the certificate and the "injury at work" item was marked "no." In agriculture, where the workplace is not clearly segregated from nonwork locations, this problem of missed work association may be especially troublesome.

The Bureau of Labor Statistics (BLS) also provides information regarding farm accidents on a national scale through two of its data bases, although the coverage of farms is limited in both cases (Bureau of Labor Statistics, 1986, 1987). The Bureau's annual survey of establishments, which produces injury rates by specific industry, allows rates to be calculated in the agricultural industries. However, farms with fewer than 11 employees are excluded from the rates. The BLS also compiles a pool of workers' compensation data called the Supplementary Data System, which can be analyzed by industry. Farms with few or no employees, however, are typically exempt from workers' compensation laws and thus excluded from the file. Harner (1987) evaluated these and other sources of farm data. Daberkow and Fritsch (1979) also evaluated various agricultural injury data sources, with emphasis on federal agencies and insurance data.

State Data Bases: Fatalities

One common source of fatality information on the state level for farm workers is the state vital statistics registrar. These registrars provide death certificates which, as discussed earlier, can be separated according to location of death or industry division if they occurred while at work. Farm safety specialists in the states often collect data from these certificates and also use newspaper clippings about rural deaths as a concurrent or sometimes sole source of information about farm fatalities. There are many studies which report data gathered by these means.

One early study of this type gathered data in Wisconsin from 1965 to 1967 and showed that 40 per cent of accidental work fatalities during that period occurred in agriculture (Wisconsin Department of Health and Social Services, 1970). For all fatal farm accidents, about 60 per cent occurred while at work. A total of 241 farm fatalities were identified for the three year period. Of these, the two leading agencies were tractors (35 per cent) and other machines (17 per cent). Data on Wisconsin farm fatalities have been updated in subsequent reports (Krantz, 1985).

The continuity of state fatality data bases allows the study of historical trends over long periods of time. One such study calculated accidental deaths of Iowa farm persons over a 25-year period from 1947 through 1971 (Wardle & Hull, 1975). During this period, a total of 10,567 deaths to farm residents were identified, an average of 422 each year. Deaths declined over the period but farm population also declined, so that the farm resident death rate actually increased. The accidental death rate for all Iowa residents declined significantly in comparison. After automobiles, tractors and farm machinery were the leading agencies of fatality, accounting for about 17 per cent of all farm resident fatalities during the 25-year reporting period.

Another state which has tracked farm fatalities over a long period of time is Ohio. Baker and Stuckey (1973) presented farm fatality data in Ohio for 1972 with 25-year averages from 1947 through 1972 for comparison. Farm fatalities dropped during the period, totalling 194 in 1972 compared to a 25-year average of 337. In 1972, 51 percent of accidental deaths to farm people occurred off the farm. For on-farm deaths during the 25-year period, tractors and agricultural machines were associated with over 40 per cent of the total.

Almost 6,200 work fatalities in New York from 1950 through 1968 were tabulated in a report published by the New York State Department of Labor (1972). Of these about 17 per cent were in agriculture. Agricultural work deaths dropped from 86 in 1950 to

28 in 1968. Almost 30 per cent of the fatalities over the 19-year period occurred to those in the 65 and over age group.

Beginning around 1930 and continuing until the late 1970s, annual reports on occupational fatalities among Kansas farmers were published by the Kansas Department of Health. The final report contains fatality data for the 35-year period from 1943 through 1977 (Kansas State Department of Health and Environment Bureau of Registration and Health Statistics, 1978). During that time annual farm work fatalities dropped from 98 to 2[illegible]. Of the 1,736 deaths in agriculture recorded during the 35-year period, over 50 per cent were associated with tractors and agricultural machines. In 1977, agricultural workers represented about 7 per cent of the Kansas work force but they suffered about 29 per cent of the work fatalities in the state.

Beginning in 1976 farm fatality data in Kansas was collected from newspaper clippings by the Agricultural Safety and Health Center at Kansas State University (Jepsen, 1981). A five year summary from 1976 through 1980 showed a total of 211 deaths, of which about half involved tractors. The author of the study found a disproportionate share of fatality among the very young and very old.

Nebraska farm fatalities from 1970 through 1982 were published in a study by Schnieder (1983). Deaths decreased significantly from 1970 to 1982 especially in the area of tractor overturn fatalities. The most dramatic reductions occurred after the introduction of roll-over protective structures.

The variety of sources used to collect fatality information in the states and the problems of classification of deaths were discussed by Murphy (1985) in a report on Pennsylvania fatalities from 1980 through 1984. Fatalities were confirmed by two of three possible sources--death certificates, newspaper clippings, and personal contact with an agricultural extension agent or the family of the deceased. Included for analysis were deaths of farm and

nonfarm residents engaged in agricultural production work and those deaths which were due to certain hazards normally associated with farming (such as farm ponds). Types of fatalities which needed to be identified and excluded from the data base were deaths of nonfarm workers who were only incidentally working on the farm (such as building contractors), leisure-time fatalities not associated with farm hazards, accidents in homes not associated with farm work, rural traffic (unless work-related), and nonfarm production.

Of 236 fatalities collected in the Pennsylvania farm fatality data base, about 71 per cent were work-related farm resident deaths. Over 25 per cent of the fatalities were to nonresidents. The average annual death rate for the 5-year period was about 35 per 100,000 workers. By agency of accident, over 50 per cent of the fatalities were associated with tractors and an additional 13 per cent with other agricultural machines.

State Data Bases: Nonfatal Injuries

Nonfatal injury information at the state level is collected by various methods. Workers' compensation has limited coverage but is a source of data which is analyzed in some states. Injuries requiring medical treatment have been tracked in some states through reports from clinics, physicians, and hospitals. Due to the lack of success in collecting information through either of these methods, procedures were introduced and gradually refined to survey farmers themselves about their injury experience. Studies of survey data will be discussed in a separate section.

Workers' compensation laws and the extent to which hired farm laborers are covered by workers' compensation vary from state to state and year to year. In general, this variability of coverage and the exclusion of farm family workers make workers' compensation data bases nonrepresentative of the broader farm accident experience. In New York, compensated work injury cases on farms during 1967 and 1968 were studied (New York State Department of

Labor, 1972). Over 1,400 cases were collected including 12 deaths. The most common agencies of accident were working surfaces (25 per cent), miscellaneous objects (22 per cent) and vehicles, including tractors (17 per cent). Of the 12 fatalities, 6 were associated with tractors.

California workers' compensation data in agriculture is of special interest since a large portion of farm workers are hired in California compared to other states. In 1976, over 14,700 disabling work injuries and illnesses and 79 deaths were reported under the California Workers' Compensation Act (California Department of Industrial Relations, 1978). The most common agencies of accident were working surfaces, miscellaneous objects and vehicles. The most common agencies for fatal accidents were trucks, tractors, aircraft, autos, and agricultural machines. Three accident types--struck by or against an object, overexertions, and falls--accounted for over 70 per cent of the cases reported.

Peterson (1973) collected nonfatal farm accident data in South Dakota over a one-year period by collecting reports from physicians, clinics and hospitals. Of the 549 cases collected, more than 30 per cent occurred to persons under 20 years of age. Tractors and farm machinery were associated with almost 50 per cent of the cases. Animals were next highest with about 9 per cent. The average amount of time lost due to accidents was about 10.5 days.

Hospital records were also the source of a study of Wisconsin patients injured as a result of agricultural trauma (Cogbill & Busch, 1985). Over a 6-year period ending in 1983, 375 such patients were admitted to one hospital. Animals were the most common agency of injury (36 per cent). Tractors had 32 per cent of the cases and farm machinery about 28 per cent. All of the 8 fatalities were associated with tractors. The authors found the overall mortality to be quite low (only 2.1 per cent of the cases), but noted that those pronounced dead at the scene or at community

hospitals within the referral area were not included in the study.

State Data Bases: Surveys

The most direct way to collect nonfatal farm injury information is to ask the farmer himself about the injury experience of his family and other workers and persons on his farm. Since not all farmers can be contacted, a statistically valid sample is usually identified by the surveyors. Unfortunately, collecting information in this way can be expensive, time-consuming, and relies on the willingness of the farmer to participate. Nevertheless, major studies of this type originated in the 1950s, with survey procedures evolving to their present status as the premier data-gathering mechanism for nonfatal farm injury data.

One very early study of this type was undertaken in 1954 and 1955 in Pennsylvania, where 1,500 members of the Future Farmers of America completed records on almost 2,300 farms (Pennsylvania Department of Public Instruction, 1957). They visited each of the farms four times during the year to interview the farmers about accidents which occurred during the survey year and for five years before the study. A total of 354 accidents during the survey year was reported, giving an accident rate of approximately 15 per 100 farms. Rates based on exposure were also calculated, with an overall rate of about 40 accidents per million hours worked. Machinery, hand tools, animals, and tractors were the major agencies of accident.

By age, accident rates per 1,000 persons were highest for those aged 15 to 19. Information was also collected by type of agricultural operation, size of farm, and many other variables. Fatality information showed six fatal accidents during the survey year, and 30 additional deaths during the 5 years preceding the study. Projecting this average based on the number of farms yielded about 340 farm deaths statewide per year, although reports to the Pennsylvania Department of Health averaged only about 110

deaths per year. Based on demographic comparisons of farms surveyed to those statewide, the authors concluded that the survey farms represented a fairly good sample, although small farms were slightly underrepresented.

Another early study was completed in Indiana during the first six months of 1958 (Ismail, 1958). Data on over 5,800 farms were collected in phone interviews by members of the Home Demonstration Clubs in nine Indiana counties. A total of 650 accidents occurred giving a rate of 11.2 per 100 farms. Only 10 per cent of the cases occurred to those aged 65 and over. The most common agencies of accident were falls-related (about 33 per cent), followed by cutting tools and appliances, vehicles, and farm machinery.

The author found many variables with statistically significant correlations to farm accident occurrence. Among them were size of farm, age and sex of victim, month and hour of day.

Gadalla (1962) surveyed 7,227 persons on 2,168 farms in Missouri during a one-year period ending in 1960. Certain core counties were selected and stratified random sampling procedures were used. Over 1,000 accidents were reported during the survey period, although only 46 per cent occurred while persons were involved in farm work. The remainder occurred during work at home or during nonwork activities.

Exposure information was also collected for total hours worked on the farm and for hours worked on particular farm machinery. An overall rate of approximately 6 disabling injuries per million hours worked was calculated. Farm work injury rates were found to have a direct relationship to several other variables including acreage, economic class of farm, size of farm operation, and degree of mechanization. The most common agencies of injury were farm machinery (17 per cent), hand tools (14 per cent), animals (12 per cent), and motor vehicles (9 per cent). "Other" agency was involved in about 44 per cent of the total. Many of the accidents in this group were falls, which were one of the leading accident types.

A much smaller survey of 297 Louisiana farms in the early 1960s tabulated data on 32 major accidents (including 4 deaths) occurring during the year preceding the survey and 23 minor accidents occurring during the month preceding the survey (Bertrand, 1964). Sample areas were drawn to include all major socio-cultural areas of the state and major agricultural crop types. Within these units, area probability sampling techniques were used to select particular farms where interviews were to be completed.

Even with a limited area and survey period, relatively large numbers of cases can be collected using survey procedures. Knapp (1965) collected almost 700 injuries from a six county area in Iowa during only a three month period in the early 1960s. Although there was little analysis of the data, a distribution by age had sufficient cases for directing age-specific safety activities.

In the late 1960s, two states, Ohio and Michigan, performed surveys which would later become the basis for the National Safety Council's Standardized Farm Survey Program. Farm surveys in Ohio had actually been done at five-year intervals since 1957. Stuckey (1969) defined procedures for the 1967 survey to include a stratified random selection of 12 Ohio counties and a random selection of interviewees in those counties. About 3,500 families participated, about 2 per cent of all farm families in Ohio. Adult volunteers in the community were recruited and trained, and interviews were conducted with participants on a quarterly basis.

Data collected from farm surveys in Ohio from 1957 to 1972 were analyzed and published by Stuckey and Pugh (1973). Farm population dropped about 38 per cent during the 15-year period, and accidents dropped about 42 per cent. Farm machinery (including tractors) was involved in about 21 per cent of the accidents in 1957, but dropped to about 14 per cent of the total in 1972. Motor-vehicle accidents increased from 8 per cent to 15 per cent of the total during the same period. Falls were the most important accident type, consistently representing over one third of the

total in the surveys.

The 1967 and 1972 Ohio surveys were the subject of a more detailed report by Phillips, Stuckey, and Pugh (1975).

Similar survey methods were employed in Michigan during a one-year study of farm accidents from June 1967 through May 1968 (Hofmeister & Pfister, 1968; Pfister & Hofmeister, 1969). A stratified random sample of 10 counties was selected, with random selection of farms in those counties. Enough interviews were planned to initially cover 3 to 4 per cent of the farm population in the state. Volunteer interviewers were recruited through county extension agents and the Farm Bureau.

The volunteers attended training sessions where they were familiarized with the two types of questionnaires used. A basic data sheet, used to determine validity of the sample and to establish variables that may be related to accidents, provided fundamental information about the farm and farm families in the sample. It also recorded exposure to farm work, which was used as the basis of accident rates. This information was collected during the initial interview only, with exposure information being an estimate of work during the preceding year.

The other form was used to report accidents. Through eleven multiple response statements, basic data about the accident was collected. These forms were completed by the interviewer during regular quarterly visits to the farms for accidents which occurred during that quarter.

During the one-year period, 280 reportable accidents occurred on the 2,139 farms in the survey. Of these accidents, about half were work related. Reportable accidents included injuries to farm family members, regardless of where the injury occurred, and injuries to hired workers while doing farm work. Only injuries which resulted in medical care or loss of one-half day or more of time from normal activity were included.

Overall injury incidence of 13.1 per 100 farms and 29.8 per 1,000 farm family members was calculated. Rates based on exposure

to farm work indicated about 20.5 work injuries per million work hours. The study found significantly higher rates of work injuries for hired labor compared to farm family workers. Significant differences also were found in the distribution of injuries by age and sex, with males aged 5 to 24 and 65 and over experiencing more injuries than expected. No significant differences were found in injury rates by size of farm or type of agricultural operation.

As a result of the comparable studies in 1967 and 1968 in Ohio and Michigan, and with the experiences reported by earlier state surveys referred to previously, the Farm Division of the National Safety Council published a handbook outlining standardized definitions, procedures, and survey forms for collecting statewide farm accident data. This handbook, first issued in 1968, has subsequently been revised and updated several times (National Safety Council, 1979, 6th Revision). While serving as a useful resource for state investigators, the purpose of the data-gathering system was to collect farm data on a nationwide scale. Besides using elements previously tested in state surveys, certain criteria were established which were to be met by the data system (Hanford, Hoskin, & Fletcher, 1977). Among other considerations, surveys were to obtain sufficient information to give the overall picture of farm accidents, provide profiles of major problems so that priorities could be set and evaluated, obtain exposure information so rates could be calculated, and provide sufficient detail so countermeasures could be suggested. In addition, the surveys were to be relatively inexpensive, be able to be repeated for verification and to check countermeasure effectiveness, and provide results without having to wait too long. Using the standardized forms and procedures, states began to conduct surveys according to a coordinated schedule of 10 states per year. Unless otherwise stated, the following studies are based on surveys performed in accordance with the national standardized farm survey system.

Almost 1,800 farms in New York, representing a sample of about 5 per cent, were surveyed in 1969 (Hoff, 1970). A total of 248

accidents were reported. Accident rates per 100,000 work days were higher for hired workers than for family members. Males had higher rates than females, and workers under 15 had the highest rates of any age group.

Jensen (1972) reported the results of the survey conducted in Wisconsin during a one-year period in 1969 and 1970. Almost 15,000 persons in farm families and a small portion of rural nonfarm families were included. Almost 650 accidents were reported. Farm machinery (including tractors) was the most common agency of accident (over 20 per cent of the total), followed by animals, motor-vehicles, and hand and power tools. By type of accident, over one fourth of the total involved falls.

The farm survey performed in Louisiana in 1970 was the subject of two studies (Novack, 1971; and Paterson, Novack, & Bertrand, 1972). Almost 1,600 farms were selected using stratified random sampling techniques, and 182 accidents occurred on those farms during the year. A rate of approximately 12 accidents per 100 farms was calculated. About 60 per cent of injuries involved farm work. The remainder of the accidents did not, although the activities were usually common around farms. Of the specified agencies of accident, the most common were farm machines, animals, and power and hand tools. Seven out of 10
accidents involved injuries such as cuts and bruises.

The standardized farm accident survey was also completed during 1970 in Nebraska (Schnieder, Florell, Baker, & Lorah, 1972). The study sample included about 7,000 persons on 1,764 farms. A comparison of the age and sex of persons in the sample with that of the entire Nebraska farm population showed the sample to be statistically representative. However, small farms were underrepresented in the sample and large farms overrepresented.

A rate of 27 work injuries per million work hours was calculated using farm work exposure data. Significant differences were found in this rate by age and sex of injured worker, with all male age groups except 45 to 64 years experiencing more injuries

than expected based on hours of exposure. Males aged 5 to 14 had the highest rates. Significant differences also were found by type of agricultural operation. Beef farms had the highest rates and grain farms had the lowest. No significant differences were found in injury rates by size of farm or for hired versus family laborers.

As states completed surveys, not only were statistical results reported, but many state coordinators also communicated various organizational and administrative problems that were encountered during the survey operations and solutions which were attempted. In this way, the coordinators hoped that their experiences would be of benefit to other states planning surveys. Brazelton (1975) proposed various recommendations based on experiences in conducting the farm survey in California. Suggestions concerning the personnel to serve as advisors, planning details and scheduling, the choice of interviewers, acceptance by those farm families interviewed, content of training sessions, and publicity, were formulated.

Robbins (1976) reported that North Carolina performed a survey in August 1973 which used the standardized farm survey procedures except for one deviation. Farmers were interviewed once and asked to recall accidents for the previous year, rather than the usual 3-month recall performed quarterly. One third of the farmers in 5 selected counties were surveyed, and information on 91 injuries was collected. Those under age 21 suffered almost 40 per cent of the injury cases. Among the specified agencies of accident, the most common were animals (19 per cent), tractors (14 per cent), and machinery, persons, and chemicals (each with 5 per cent).

Because of its small geographical area, New Hampshire farm safety specialists chose a random sample of farmers in all 10 counties of the state rather than a selection of counties (Heckel, 1978). A total of 120 farms were surveyed during 1977, representing approximately 5 per cent of the farms statewide. Injury cases numbered 42, with hired workers accounting for about

60 per cent of the injuries reported. The most common agencies of accident were animals (19 per cent), agricultural machines except tractors (12 per cent) and power tools (10 per cent). Falls accounted for about one quarter of the injury cases.

Farms surveyed in West Virginia during portions of 1977 and 1978 represented over 7 per cent of all the farms statewide, a relatively large percentage compared to other states (Stump, 1979). Over 1,200 farms participated, and an injury rate of 5.4 per 100 farms was calculated. Cuts and bruises represented over one third of the cases, and fractures accounted for about 17 per cent.

A 3 per cent sample of Colorado farms and ranches yielded 770 units which were surveyed during portions of 1977 and 1978 (Colorado State University Cooperative Extension Service, 1980). Of 83 injuries identified on those farms, 28 per cent were falls. Fractures were the most common injury type (27 per cent of the total). Cuts were responsible for another 25 per cent. Animals were by far the leading agency of injury, with almost one third of the cases. Trucks were next most important (10 per cent), followed by agricultural machinery except tractors (8 per cent).

Results of the 1981 farm survey in Iowa were reported by Williams (1983). Twenty counties were selected, and 2,578 farms in those counties participated. This represented slightly over 2 per cent of all Iowa farms. Injuries totalled 241 and a rate of 21.2 accidents per million work hours was calculated. Injury rates were highest for larger farms and lowest for smaller farms. By type of agricultural operation, beef farms had rates 50 per cent higher than the average. As reported by earlier studies, younger workers (those less than 15 years) had significantly higher injury rates than the average.

A 6 per cent sample of Delaware farms was surveyed during portions of 1983 and 1984 (Jester, 1985). Of the 171 farms surveyed, about 1 in 7 reported an injury during the one-year period. Work injury rates overall were about 15 per million work hours, with those in the 15 to 24 year age group having the highest

rates. Tools were associated with over one fourth of the injury cases, and animal-related cases another one fifth of the total. About 40 per cent of the cases involved slips and falls.

Standardized Farm Accident Survey: National Data Pool

As states began to complete surveys, the collected data were sent via computer tape or punched cards to the National Safety Council. Since information was collected using standard forms and procedures, state data were able to be pooled to form a national data base. In turn, this national data base was analyzed periodically by various researchers and reports were generated.

The first such report analyzed data from 8 states (Hanford & Conrath, 1972). About two thirds of the injuries were work-related; one third occurred during leisure time activities. Farm machinery (including tractors) was involved in about 21 per cent of the injuries, the most common agency. Tools, both hand and power, were a factor in 12 per cent of the cases. Animals and motor vehicles accounted for 11 per cent each. Nearly one third of the cases involved falls, with cuts and bruises the most common injury type overall.

A pool of 10 states' data containing more than 3,800 accident cases was analyzed by Conrath and Hanford (1973). Per cent distributions for major variables changed little from the 8-state analysis. About one per cent of the cases involved a fatal injury, with automobiles accounting for the highest proportion of fatalities, more than 25 per cent. Tractors were involved in about 14 per cent of the deaths.

By 1976, 15 states had contributed data to the pool and data were again summarized (Hanford, 1976). Of the total injuries, nearly half were found to have occurred on the farm itself (excluding home), about 23 per cent in the home and yard, 7 per cent on roads and highways, and 17 per cent in other places off the farm. Work-related cases accounted for about two thirds of the injuries, the same as in earlier analyses. The four major

agencies of accident were still found to be farm machinery (including tractors), hand and power tools, animals, and motor-vehicles.

Cuts and bruises were by far the most common injury types, with about 40 per cent of the cases. Fractures occurred in about 20 per cent of the total, and sprains in about 15 per cent. Amputation occurred in less than 2 per cent of the injuries, with most of these involving the finger or fingers.

A more comprehensive report was published in 1979 when a new data base of 18 states was analyzed (Hanford, Burke, Fletcher, Recht, Hoskin, & Miller, 1979). Some 978,493 farms, about 42 per cent of the nation's total, were located in the 18 surveyed states. The data base contained over 23,000 of those farms, a 2.4 per cent sample.

The proportion of work-related injuries increased from previous studies to about 75 per cent of the total. Of these work injuries, the most common specified agencies of accident were truck or other vehicle (18.4 per cent of the total), animal (17.8 per cent), agricultural machinery except tractor (17.4 per cent), hand and power tool (12.5 per cent), and tractor (7.9 per cent). In over one fourth of the cases, the agency of accident was either unspecified or "none" (usually falls).

An overall work injury rate of 18.2 per million work hours was calculated. Injury rates for those aged 5 to 14 were 22.4 per million work hours, the highest rate of any age group. Those aged 65 and over had the lowest rates, 15.6 per million work hours. Hired workers had higher rates than family workers, and males had higher rates than females.

A large portion of the analysis in the 18-state report was accomplished by grouping surveyed farms into five major commodity groups--beef, dairy, grain, fruit, and other. The researchers felt that countermeasures could be better formulated and communicated to farmers if the resources of agencies representing commodities were utilized. By presenting data in this way, commodity groups

could tell which accident circumstances were particular to their own type of operation. Of the four specified commodity groups, beef farms had the highest rate of work injuries per million work hours (19.8), followed by dairy (17.7), grain (17.3), and fruit (16.5). Scenarios of the accident circumstances which occurred with a statistically higher than expected frequency were constructed for each of the commodity groups.

A pool of data from 21 states with over 24,700 farms was analyzed by Hoskin and Miller (1979). A total of 126,051 persons were covered by the surveys in those states and 4,176 injuries and illnesses were recorded. The sample was checked on the basis of distribution by size of farm, and found to be significantly different from the distribution for all farms in the states surveyed. Farms of less than 200 acres were underrepresented and farms of 200 acres and more were overrepresented.

Significance tests were performed related to age and sex of injured person, family status, and agricultural operation. Age was significantly related to injury frequency for both family and hired males, with family males aged 5 to 24 and hired males aged 15 to 24 being overrepresented in injury frequency. Age was not a significant factor for either family or hired females. Sex and labor status were also found to be related to injury frequency, with males having significantly more injuries than females based on exposure, and hired workers having more than family workers. The distribution of work injuries by type of agricultural operation was not significantly different from the distribution of work hours.

Later in 1979, with 24 states in the data base, the file was analyzed again, but few differences from earlier reports were found in the distribution of major variables (Hanford, Hoskin, & Miller, 1979).

In 1982, the last major analysis of the national pool of standardized farm surveys was completed (Hanford, Burke, Fletcher, Hoskin, & Miller, 1982; and Hanford & Fletcher, 1983a). The data

base consisted of 160,789 persons on 31,398 farms and ranches, representing 2 per cent of all farms and ranches in the 31 surveyed states. Reported injuries totalled 4,612, of which over three fourths were work-related. Nearly two thirds of the injuries occurred in farm buildings, fields, and other work areas. About one third occurred in the home, yard, or on roads and highways.

The leading specified agencies of accident were animals (about 17 per cent of the total), agricultural machines except tractors (16 per cent), trucks or other vehicles (15 per cent), hand and power tools (12 per cent), and tractors (8 per cent). Tractors were the leading agency of accident for fatalities, with about one third of the cases. Cuts were the leading injury type (about 23 per cent of the total), followed by fractures (16 per cent), sprains (16 per cent), and bruises (13 per cent). Regional analysis of the data was also performed.

Studies of Specific Farm Safety Topics

The studies that have been previously considered in this literature review have dealt for the most part with overall farm injury surveillance, without emphasis on the study of particular problem areas. These studies, however, have suggested that certain agencies, accident types, age groups, and other factors are related to the incidence of farm injuries and are deserving of further study.

There is a considerable body of literature regarding specific farm safety topics. Tractors and farm machinery are the subject of the greatest number of these, and such studies were reviewed in separate reports (Hoskin, Miller, Hanford, & Landes, 1988a; and Hoskin, Miller, Hanford, & Landes, 1988b). A brief review of other specialized studies follows here.

Farm accidents to children and adolescents were studied by Field and Tormoehlen (1982). Nonfatal injury data on children were gathered from the 1976 Indiana standardized farm survey, and fatality information from 1970 to 1981 was gathered from state

vital statistics sources. The researchers concluded that accidents were the leading cause of death for farm children and adolescents, and that a significant portion (10 to 25 per cent) of all serious farm-related accidents involve persons under age 16. Most of the fatalities were associated with tractors and machinery, with extra riders on farm equipment responsible for a high percentage. Doss (1983) also concluded that exposure to farm machinery accounts for a large portion of farm accidents to minors, between 25 and 50 per cent.

Rivara (1985) estimated that nearly 300 children and adolescents (less than age 20) die each year from farm injuries and 23,500 suffer nonfatal injuries. Fatality rates were found to increase with age, with the most common agency of both fatal and nonfatal injuries being agricultural machinery (including tractors). Tractors were associated with one half of the farm machinery deaths.

Hospitalized injuries to patients less than 19 years old that occurred due to accidents on farms were the subject of researchers at one Wisconsin hospital (Cogbill, Busch, & Stiers, 1985). Over a 6 1/2-year period, 105 such patients were admitted. The agency of accident was animal in 40 per cent of the cases, tractor or wagon in 26 per cent, farm machinery in 20 per cent, fall from farm building in 6 per cent, and miscellaneous in 8 per cent.

Accidents involving animals were the subject of a study by Hoskin and Miller (1979), utilizing detailed information from the standardized farm accident data pool. Of 414 cases for which detailed animal accident information was available, 344 were work-related. The most common injury type was bruise (24 per cent of the total), followed by fracture (23 per cent). Of the animals involved, 57 per cent were cattle, 27 per cent were horses, 5 per cent were hogs, and the remainder were other animals. Cows were responsible for almost three fourths of all cattle-related injuries. For each animal type, scenarios were constructed of accident circumstances which occurred statistically more often than

expected.

Researchers in Wisconsin identified 134 patients admitted to one hospital due to injuries from cows and horses (Busch, Cogbill, Landercasper, & Landercasper, 1986). The most common accident types were fall from horse (33 per cent), kicked by cow (21 per cent), assault by cow (19 per cent), assault by horse (13 per cent), and kicked by horse (8 per cent). The authors for the use of personal protective devices and increased ion regarding animal handling. Mainzer (1966) suggested design changes to eliminate direct contact between animals and persons in animal-handling facilities.

Accidents involving electricity have also been the subject of specialized farm accident research. Fletcher (1974) used insurance data combined with newspaper clipping accounts to identify 98 accidents involving electricity which resulted in injury or death to over 100 persons. Almost 90 per cent of the victims were male, and 80 per cent of the injuries were fatal. Of the cases with specified activity at the time of accident, the most common were repair or servicing, grain handling and feed handling. Almost 60 per cent of the cases involved power line contact, with augers, elevators, and irrigation equipment most commonly involved. Fletcher (1978) suggested several countermeasures including protection of metal machine parts, isolation of operator, a traveling ground, and education programs.

Farm electrocutions in Washington state were studied by Helgerson and Milham (1985). Using information from death certificates, 42 farm electrocutions from 1950 to 1979 were identified. Based on the experience of the general population, only 18 were expected. Of the farm electrocutions, those which were irrigation pipe-associated numbered 23, very similar to the number of observed deaths in excess of expected. Irrigation pipes were the most common source of fatal human contact with electrical lines.

Electrocutions involving portable grain augers were the subject of a bulletin issued by the National Institute for Occupational Safety and Health (1986). Investigations of case reports found five fatalities within four days in two separate incidents during 1985 while moving this type of equipment.

Another specific type of farm accident for which data have been compiled is entrapment or suffocation by flowing grain. Field and Bailey (1979) identified 59 separate cases of this type, including 38 fatalities, in Indiana between 1964 and 1978. Nearly 40 per cent of all the suffocations and over 43 per cent of the reported entrapments involved children under 15. Accidents inside round metal storage bins were the most common type. Fatalities involving grain handling which were reported to the Occupational Safety and Health Administration were summarized by Cloe (1983).

Eye injuries in agriculture were the subject of a study by Saari and Aine (1984). Of patients with eye injuries treated at one hospital in Finland, about 15 per cent were agricultural workers. The incidence of eye injuries in agriculture was calculated at 3.46 per 10,000 population. The most common causes of injury were chemical eye burns, cow butting with horn, or flying wood chips.

Specific agricultural operations have also been studied by researchers. Information about dairy farms was extracted from the national standardized farm survey data pool of 31 states by Hanford and Fletcher (1983b). Although dairy farms represented less than 20 per cent of the farms in the data pool, they accounted for about 35 per cent of the animal-related injuries in the file. Wives and children were more frequent accident victims
on dairy farms, compared to the experience of all farms. Wet working conditions were present in about 10 per cent of the cases.

The poultry industry was the subject of a unique study by farm safety specialists in California, who used standardized farm survey techniques to gather injury data in this one particular commodity group (Brazelton, Ernst, Knutson, & Brooks, 1984). Over 400

injuries were identified, with hired workers suffering 96 per cent of the total. Based on hours of exposure, injury rates were highest for those in the 15 to 24 year age group. The most common injury scenario was overexertion resulting in sprained back.

Medical treatment of farm injuries has been addressed by medical specialists in rural areas. Payton (1986) outlined various characteristics which make treatment of farm injuries unique, including patient age, distance to treatment, and frequency of need for extrication. Due to the wide array of chemicals, fertilizers and other toxic substances in use by farmers, medical personnel may not have experience in dealing with the variety of injuries that farmers suffer (Pollard, 1982).

Prose (1978) also cited the wide variety of locations and circumstances of accident for which emergency medical personnel treating farm injuries must be prepared.

Environmental and occupational health of farmers was the subject of research in Michigan (Baker & Wilkinson, 1974). Volunteer interviewers in 14 counties provided information on a total of 851 farmers during 1983. Chronic back pain was the major health problem reported by the farmers. The most common environmental problem was dust, although the incidence of respiratory disease did not appear to be unduly high. Likewise, little impairment from the use of pesticide was reported, although over 90 per cent of the farmers used pesticides regularly in the last 10 years. Noise-induced hearing loss was identified by the researchers as a serious problem due to effects of cumulative exposure to agricultural equipment noise.

Various safety attitudes and practices, emotional maturity, and other predictive factors associated with presence or lack of farm accidents have been sought by researchers in many studies. Erisman and Huffman (1972) collected data on 2,547 male farm operators and 381 female farm residents in Illinois, who were asked to supply data on their age, size of farm, and five-year accident history. In addition, the subjects completed a test of emotional

maturity designed to produce a single numerical index based on an inventory of impulsiveness, carelessness, aggressiveness, intolerance, and other factors. Emotional immaturity as measured by this scale was found to significantly increase accident susceptibility for both male and female farm operators. Larger farm size and younger age groups were also significantly related to lower emotional maturity and greater accident frequency.

Murphy (1981), however, found no relationship between attitudes toward farm safety concepts and accident involvement. Sampling almost 500 farmers in Pennsylvania who were given a test to measure farm safety attitudes, the study found no difference in scores between one group of farmers who had one or more farm work-related accidents in the last five years versus a group who had no accidents. The author concluded that the high priority given to safety attitude development for farmers be re-examined.

Factors related to certain safety attitudes and practices were reported by researchers who interviewed 154 randomly-chosen subjects in Louisiana (Schafer & Kotrlik, 1986). Subjects were interviewed concerning their knowledge of, attitude about, and compliance with certain safety factors such as tractor roll bars and seat belts, fire extinguishers, farm safety programs, safe maintenance and refueling procedures, and lack of extra riders on implements. From this inventory a safety index score was generated. Participation in a farm safety program, more acres cultivated, and higher income were all significantly related to better safety attitudes and practices as measured by the index.

Napier, Goe, and Pugh (1985) cautioned that although many factors commonly studied may be related to accident occurrence, the strength of the association is often quite low. The researchers studied the accident experience of 918 Ohio farmers in 1982 and tracked 18 separate variables mentioned in the literature as being related to accident involvement. Although many significant relationships existed in the data, only 6 per cent of the variance in accident occurrence could be explained by the 18

variables. These variables included years in farming, size of farm, tractor and machinery usage, safety awareness, safety equipment in use, education, and number of hired workers. The researchers suggested that new avenues of investigation be undertaken to identify other variables which may have better predictive capabilities such as ecological factors, timing of accidents, psychosocial orientation, and fatigue.

Other studies not specifically cited in this review because they could not be located or because of similarities to other research may nevertheless be valuable to the reader. Among the various topics of these studies are: accident surveys (Doss & Pfister, 1972; Field & Bailey, 1977; Hanford & Fletcher, 1974; Hill & Dennis, 1975; and Piercy & Stallones, 1984), foreign studies (Singleton, Ainsworth, & Stroder, 1984), workers' compensation data (Burkart & Egleston, 1977), and general discussions of farm accidents (Becker, 1982; Bible, 1970; Buckingham, 1981; Cliff, 1981; and Muckala, 1967).

Method

The survey design and data collection involved in the management and execution of the farm surveys was described in detail in the procedures manual (National Safety Council, 1979) but is reviewed here, too. Additional details concerning data processing at the Council are also reported.

Survey Design

Sample selection. The first step in the survey was to select the size of the sample and the counties to be included in the survey. Sample size was determined by the trade-off between the cost of collecting the data and the precision of the estimates derived from the data. A sample size of about 2,500 farms was recommended.

Selecting the counties to be surveyed was done at this early stage because this determined which county extension agents would have to be contacted to help with the administration of the survey and where volunteer interviewers would have to be recruited.

The state to be surveyed was divided up by counties. If individual counties did not contain at least 800 farms, then they were grouped with neighboring counties. The counties or groups of counties were numbered consecutively and five independent groups of ten counties were selected using a table of random numbers. The distribution of farms by type of agricultural operation in each of the five groups was compared to the distribution of farms in the entire state and the group most closely matching the statewide distribution was selected as the primary group of counties for the survey. If one of the county extension agents in the sample group was unable to cooperate in the survey, then the corresponding county in the next sample group was used as a substitute.

Administrative organization. The next step was to contact the county extension agents and enlist their support and cooperation. The agent's duties and responsibilities in helping

to conduct the survey were clearly spelled out so that there would be no misunderstanding about the amount of work required.

A project budget and sources of funding were lined up to cover the various costs involved: travel, duplicating, postage, telephone, computer time, and clerical and other project staff salaries.

Project schedules were also prepared so that the survey would not interfere with the farmers' work at busy times such as planting or harvesting.

Interviewers. Members of various adult farm-related organizations such as Farm Bureau Women and Extension Homemakers Clubs were recruited to do the interviewing. They were not paid for their services. About one interviewer for every 12 farms in the sample was needed with about five percent extra to compensate for dropouts. Interviewers were trained in group meetings, given packets of instructions and forms, and assigned a randomly selected route to follow in locating the farms to be interviewed.

Radio and newspaper publicity for the survey was prepared and distributed to alert farmers to the existence of the survey and its importance, and to make the interviewers job somewhat easier.

Questionnaires. The complete set of data collection forms for the farm survey consisted of 15 forms. Examples of the forms may be found in Appendix A. Each of the forms was from one to four pages long and asked no more than 16 questions. The content and purpose of the forms are described here.

The Master Data Sheet (F1) was used to determine if the property qualified as a farm under the current U.S. Department of Agriculture definition and to collect the estimated hours of exposure to farm work for the family members and the hired help expected to be employed during the survey period. The F1 was also used to classify the farm by the major type of agricultural operation and to inventory the number of pieces and types of farm equipment used. [A general health information supplement (F1-A) to the master data sheet was used by some states to collect data

on the prevalence of hearing problems, allergies, lung disorders, and other chronic conditions, but these data were not forwarded to the Council for the pooled data file.] Beginning in 1979, a revised version of the Master Data Sheet was used that simplified the collection of exposure data. Both versions are shown in the Appendix A.

The General Accident and Illness Report (F2) form was used to collect basic data about each person injured in an accident and the circumstances surrounding the event. It was also used to indicate which bi-level forms were to be used to obtain additional detailed information on certain kinds of injury cases.

Beginning in 1979, a revised, simplified version of the General Accident and Illness Report was put into use. Many of the state extension safety leaders who had been involved in conducting the surveys thought that the general form was too long and that enough data had been collected on some of the variables.
To respond to their needs, and to simplify the list of responses to some of the questions, three things were done. Collection of data on illnesses was dropped; the extension safety leaders did not think the information was complete or useful. A separate form was created for non-work-related injuries [Nonagricultural Accident Report Form (FN)]. And the work-related injury report form was edited down from 32 to 14 basic questions. Both versions of the F2 form are shown in Appendix A. Figure 1 shows which questions were asked on each form.

The remaining 13 forms were bi-level forms. The concept of bi-level reporting was developed to reduce the apparent burden of reporting detailed information on certain kinds of injuries while providing researchers with a flexible means of getting the detailed information needed to identify countermeasures. If all of the questions that one wanted to ask about farm-related injuries were put on one report form, the form would contain more than a hundred questions and be several pages long. (The 13 bi-level forms used in the farm surveys contained, in total, 127 questions on 25

pages.) Since only a few of the questions apply to any one injury, there is no need to put all of the questions into one extensive form. Questions on a specific subject, such as tractors, are put on a separate form which is used only when the injury is related to that subject. Using a series of separate forms rather than "go to" directions on a single form also has the advantage of allowing states to add or omit bi-levels depending on their needs and to change the questions easily.

Most of the bi-level forms used in the farm survey were designed to identify the specific agent involved in the accident and to determine any hazardous conditions or unsafe acts that contributed to the accident.

The bi-level forms described here were used from 1975 onward. Prior to that time a different set of eight forms was used which covered costs, athletic injuries, moving machine parts, tractors, slips and falls while walking, tools, animals, and emergency medical services.

The Agricultural Tractors (F4) bi-level was used to gather data on the characteristics of the tractor, how and where it was being used and some data specific to overturning accidents. Thirty-one states used the form and 304 forms were completed.

The Farm Machinery (F5) bi-level was used to identify the specific type of machine, its characteristics, and how and where it was being used. Thirty-two states used the form and 727 forms were completed.

The Animals (F6) bi-level was used to obtain information about the kind of animal, the specific activity involving the animal, and where the event occurred. Thirty-two states used the form and 1,522 were completed.

The Agricultural Chemicals (F7) bi-level was used to identify the chemical and where and how the exposure occurred. Seventeen states used the form and 49 forms were filled out.

The Hand and Power Tools (F8) bi-level was used to identify the specific kind of tool and how it was being used. Twenty-nine

states used the form and 499 forms were completed.

The Slips and Falls (F9) bi-level was used to get information on the type and condition of footwear, the specific location, and the involvement of any object or hazard. Twenty-seven states used the form and 839 were completed.

The Illness (F10) bi-level was used to identify the type and source of the illness. Twenty-six states used the form and 489 were filled out.

The Agricultural Wagons (F11) bi-level was used to identify the specific kind of wagon and its condition, and the location and circumstances of the accident. Nineteen states used the form and 89 forms were completed.

The Lawn, Garden and Miscellaneous Powered Equipment (F12) bi-level was used to identify the specific piece of equipment and its condition, and the activity and location of the accident. Twenty-one states used the form and 154 forms were completed.

The Tractor and Machinery Operator Educational Information (F13) bi-level was unique in that it was not used at the accident level, but rather at the exposure level. When the Master Data Sheet (F1) was completed, an F13 was to be filled out for each operator working on the farm or ranch. The form asked for the number of years of formal education and amount and kind of specialized operator training. Unfortunately, it did not ask how recently the training had been completed. Twenty-three states used the form and 30,735 were completed.

When the F13 was first filled out, the interviewer was to fill in the county, interviewer, and household numbers, leaving the accident number blank. Then, when an accident involving a tractor or agricultural machine occurred, the county extension agent was supposed to match the F2 with the F13 using those three numbers plus the name and age of the person involved. The agent would then enter the F2 accident number on the F13.

The general injury/illness file indicates that there were 924 tractor- or machinery-related injuries in the surveys. But the F13

forms indicate 2,985 cases with an accident number entered. This leads us to question the utility of the information that may be gained from this bi-level, but it may be worth further investigation.

The Agricultural Trucks (F14) bi-level was used to collect detailed data on the type of truck and how it was equipped, how it was being used, and the circumstances of the accident. Twenty states used the form and 129 were filled out.

The Forestry and Woodlot Activities (F15) bi-level was used to obtain information about the equipment and activities common to work in forests and woodlots. One state used the form and 5 forms were completed.

Interviews. All interviews were conducted in person. The interviewers were instructed to locate 12 farms or ranches along their randomly assigned routes. If the farmer or rancher agreed to cooperate, then the master data sheet (F1) and operator education forms (F13) were completed. General accident/illness reports and appropriate bi-levels were also completed for any injuries or illnesses that had occurred in the previous three months. A reminder sheet was left with the family on which they could record the occurrence of any reportable injuries or illnesses that happened before the next interview.

At three month intervals, the interviewer contacted the family by telephone and arranged for an interview if any injuries or illnesses had occurred.

Forms handling. The interviewers mailed all completed forms along with a summary sheet to the county extension agent in charge of his or her territory. The agent checked the summaries to see that all the interviewers had contacted the required number of farms (first quarter) or re-contacted all farms (second, third, and fourth quarters). The agent also checked the forms to see that none was missing and that the forms were complete and free of contradicting statements. He then sent the forms to the project staff.

The project staff re-checked and re-edited the forms and returned them to the extension agent for follow-up when necessary.

Reports. The project staff was strongly encouraged to prepare for each county quarterly summaries of the data collected so as to provide positive feedback to the interviewers.

The project staff in each state was responsible for preparing its own statewide summary report of the survey results. Most states did so and several of these were discussed in the literature review section. When this was completed, the survey data were sent to the National Safety Council in machine readable form.

Data Processing

At the Council, the survey data was further edited and then combined with other states into pooled data files. Two main files were constructed. One file was maintained for the master data sheet (F1) information. This file was used to compute the number of exposure hours for the denominators of the injury rate calculations. The second was maintained for the combined general accident/illness report (F2) and medical and cost (F3) bi-level data. The first file will be referred to as the "exposure" file and the second as the "general injury/illness" file.

Creating the general injury/illness file out of the F2 and F3 data required matching the two forms using the state, county, interviewer, household, and accident numbers. This matching process resulted in discarding a number of the F3 forms because they could not be matched with F2's. All 5,753 F2's were retained for the general injury/illness file and 3,306 F3's could be matched with an F2.

In addition to the two main files, a number of specialized files were created. A special work injury file was created by extracting from the general file those records for which the "work or leisure?" question had the "work" response and the "injury or illness?" question had the "injury" response. Of the 5,753 total cases in the general file, 4,105 were work injuries (and 2,242 of

these had matching F3's). The general work injury data file of 4,105 cases was used in the analyses reported here.

Several matched bi-level files were also created. To build these files, the state, county, interviewer, household, and accident numbers on the F2/F3 records in the work injury file were matched with the corresponding numbers on bi-level forms. When an exact match was found, the two records were combined and written to the special file. The combined records then contained all of the basic data from the general accident/illness and medical/cost forms plus the specialized, detailed data from the bi-level form.

The matching process resulted in the loss of some otherwise usable F2/F3 and bi-level records when one half of the pair could not be found. For example, the work injury file contained 323 tractor-related injuries and there were 304 tractor (F4) bi-levels, but the matched file contained only 228 records.

Analysis Techniques

Multi-dimensional crosstabulations were used for the data analysis. All of the scenarios were developed using this technique.

Chi-square was the statistical test of significance used in the data analysis.

Limitations

There are several factors that may limit the interpretation or generalizability of the results of these analyses. First is the representativeness of the sample of farms. Each state sample was selected to be representative of the state, but the states together are not necessarily representative of the total United States. This is discussed more fully in the Results section.

Data quality is another limiting factor. Some of the questions were not clearly worded or were misinterpreted by the interviewers. For example, question 14F on the general accident and illness report (F2) asked for the "thing involved" in the

injury. This could be taken to mean the agency of the accident or the source of injury. It seems to have been interpreted as the agency of the accident, but we cannot be certain in all cases. In other cases, for example, the injury occurred indoors, but the environmental conditions were given for the outdoors.

There are some problems with inconsistent responses. The most obvious involved situations where the reported sex does not agree with the family status, e.g., female sons or male wives. These cases do not affect the outcome of the analysis, but there are also less obvious cases that might affect the analysis.

The change in the content of the general injury/illness report form in 1979 affects the interpretation of crosstabulations that involve one variable that appears only on the original F2 versus another variable that appears on both the original and revised F2's.

There is the problem mentioned before of matching bi-level forms with the general injury/illness forms. If there is any systematic bias in the rejection of unmatched forms, then that could affect the representativeness of the cases on the matched file.

The number of cases, while large to start with, diminished rapidly as more criteria were added to the crosstabulation specifications. Generally, not more than three or four criteria could be used. This limited the specificity of the scenarios generated in the analyses.

The state surveys were performed over a period of more than ten years in the 1970's and 1980's. New equipment and new methods introduced over that time may have influenced the injury patterns. In particular, because the make and model of tractors and other powered machinery was not recorded, it was not possible to associate injury patterns with particular machines. This made it difficult to recommend specific engineering countermeasures or interventions.

Definitions

It is important to be familiar with some of the definitions used in the farm surveys in order to understand and interpret the results properly.

A farm is a place consisting of 10 or more acres of land and selling $50 or more of agricultural products annually, or consisting of less than 10 acres and selling $250 or more of agricultural products annually.

A reportable accident is an occurrence that results in death, an injury requiring professional medical care, or loss of one half day or more from usual activities (work, school, etc.) that involves a person (a) living on a farm, regardless of where the accident happened, (b) working on a farm when the injury happened, or (c) visiting a farm when the injury happened.

Professional medical care is one or more contacts with a physician either by telephone or in person. The service may be given by the physician, a nurse, or by another person acting under the physician's supervision.

The levels of severity of injury are defined as follows: Slight injuries require no medical treatment except bandage, antiseptic, etc. Severe injuries include broken bones, cuts requiring medical care, sprained backs, etc. Permanent injuries include any loss of full use of any body part, amputation, etc. Fatal injuries are those that result in death during the survey period.

FIGURE 1
COMPARISON OF QUESTIONS ON ORIGINAL
AND REVISED GENERAL ACCIDENT
AND ILLNESS REPORT FORMS

QUESTION	F2 QUESTION NUMBER	
	Original	Revised
Resident class	1A	1
Age	1B	2
Sex	1C	3
Number of persons injured	2	-
Work or leisure	3	-
Month	4A	4
Day of week	4B	-
Time of day	4C	-
Injured or ill	5	-
Severity	6	5
Type of activity	7A	9
Action (bodily motion)	7B	10
Who administered first aid	8	-
Number of physician treatments	9	-
Nature of injury	10	6
Part of body	11	7
Type of accident	12	11
Where treated	13	-
Temperature	14A1	-
Precipitation	14A2	-
Wind	14A3	-
General location	14B	8
Surface condition	14C	-
Surface type	14D	-
Light condition	14E	-
Agency of accident	14F	12
Source of injury	-	13
Exposure to agent on day of injury	14G	-
Experience with agent	14H	-
Agricultural operation	15A	-
Acreage in operation	15B	-
Dollar amount of ag production	15C	-
Additional information	16	-
Role of victim	-	14

Results

The farm survey file contains the results of 35 state surveys completed in 31 different states. (Four states were surveyed twice.) A total of 37,293 farms participated in these surveys and information was recorded on 4,105 work-related injuries. A complete frequency and per cent distribution of these rates for all variables is included in Appendix B.

Of the farms surveyed, 28.9 per cent were corn, sorghum, and small grain operations, 19.2 per cent produced beef, and 17.6 per cent were dairy farms. The remaining 34.4 per cent of the farms represented a wide variety of agriculture operations. Because of differences in classification schemes, it was not possible to check the representativeness of this sample in terms of type of operation against the Census of Agriculture.

It was possible, however, to check the sample on the basis of distribution by size of farm. Table 1 shows the distribution of farms by size, and the total expected distribution based on the 1982 Census of Agriculture. The sample distribution was significantly different from the expected distribution based on the census ($X^2 = 8,156$, $df = 5$, $p < .001$). Farms of more than 200 acres were overrepresented in the sample, and farms of less than 100 acres were underrepresented. Consequently, although still useful in identifying accident problems, the results of the survey cannot be used to directly estimate the national agriculture accident experience.

Of the 184,650 persons covered by the survey, 68.9 per cent were family members living and working on the farm and 31.1 per cent were hired help. Males made up 55.9 per cent of the family members and 80.5 per cent of the hired workers.

A total of 203.6 million hours of exposure to farm work was reported in the survey. Family members accounted for 79.8 per cent of those hours and hired help accounted for 20.2 per cent. Males recorded 74.8 per cent of the hours worked by family members and

90.0 per cent of the hours worked by hired labor.

Table 2 shows a breakdown by age of the number of family members and hired help in the survey and percentages of work exposure and injuries experienced by the groups. The age distribution of family members surveyed differed slightly from that of hired help. As expected, there were more family members in the 15 and under and 45 and over age groups compared to hired workers. Hired workers were much more likely to be in the 15 to 44 year age group. The work exposure distribution by age followed a similar pattern. For both sexes, family members aged 25 to 64 accounted for 74.3 per cent of the work exposure, while hired help aged 15 to 44 accounted for 74.6 per cent of work exposure for that group. This would suggest that the median age for hired workers was considerably lower than that for family members.

Injury information corresponded closely to the exposure distribution. Family members experienced 78.0 per cent of the work injuries, while hired help experienced 22.0 per cent. Males experienced 83.1 per cent of the family member injuries and 91.8 per cent of the hired worker injuries.

Rates were developed to measure injuries per million hours of exposure to farm work. These are shown in Table 3. For family members of all ages combined, males experienced significantly higher injury rates than females ($X^2 = 115.19$, $df = 1$, $p < .001$). Male and female hired workers demonstrated similar, but nonsignificant differences in injury rates. Combining family and hired help, the difference in injury rates by sex was significant, with males having much higher rates than expected and females much lower based on work exposure ($X^2 = 120.42$, $df = 1$, $p < .001$).

Combining males and females, comparison of injury rates for family versus hired workers indicated significant differences in injury experience for the two groups ($X^2 = 7.78$, $df = 1$, $p < .01$). The injury rate for family members was 19.5, while the hired help rate was 21.7. The overall rate for all workers was 20.0 injuries per million work hours.

Age was significantly related to injury experience for family males ($X^2 = 48.14$, df = 4, $p < .001$) and family females ($X^2 = 10.10$, df = 4, $p < .05$). Family males aged 5 to 24 were overrepresented in the injury distribution, and those 45 and over were underrepresented. Hired males also experienced significant differences in injury rates by age ($X^2 = 37.87$, df = 4, $p < .001$), with ages 15 to 24 experiencing higher rates than expected and ages 25 to 64 experiencing lower rates. Age was not a significant factor for hired females.

Injury rates were similarly developed by size of farm (Table 4) and type of agricultural operation (Table 5). Size of farm was found to be a significant factor in the distribution of work injuries ($X^2 = 43.90$, df = 5, $p < .001$). Small farms (49 acres or less) experienced the highest injury rates (24.9 per million work hours) with farms of 200 to 499 acres having the next highest injury rate, 21.7. Hired help on small farms had the highest injury rate of any family status and size of farm combination.

Significant differences between observed and expected injury frequencies were also detected by type of agricultural operation ($X^2 = 96.84$, df = 4, $p < .001$), with beef, dairy, and fruit farms having higher than expected numbers of injuries. The differences in rates between family members and hired workers for various agricultural operations were most dramatic for fruit farms, where the rate for hired males was almost three times that for family males. In contrast to other agricultural operations, female family members on fruit farms experienced higher injury rates than their male counterparts.

Table 6 lists the distribution of work injuries by severity, age, and family status. Of the 4,105 reported work injuries, 30.2 per cent were described as slight (no medical treatment other than first aid) and 65.4 per cent were reported as severe (requiring medical attention). Injuries were described as being permanent (loss of full use of body part) in 1.9 per cent of the cases, fatal

in 0.7 per cent, and 1.8 per cent were of unknown severity. For family and hired persons combined, the distribution of fatal injuries by age differs from that of all injuries. Those aged less than 15 and greater than 64 were over-represented for fatalities.

The severity of injury was further examined as a function of agricultural operation and agency of accident (Table 7). Dairy operations accounted for the largest percentage of slight, severe, and permanent injuries, with grain farms experiencing the next highest percentages in these severity groups. Grain farms, however, accounted for a slightly higher percentage of the fatal cases than did dairy operations.

By agency of accident, agricultural machinery was involved in 17.6 per cent of all injuries, followed by animals with 16.9 per cent, and no specific agency with 15.4 per cent. Animals, however, accounted for the greatest number of slight injuries, 17.4 per cent. Agricultural machinery was associated with 47.5 per cent of injuries leading to permanent impairment. Power tools were associated with the next highest percentage of permanent injuries with 10.0 per cent of the total for that category. The distribution of fatal injuries varied considerably from that for all injuries, with tractors accounting for 26.7 per cent of fatalities, and agricultural machinery, other vehicles and no agency each associated with 13.3 per cent.

Table 8 displays the relationship between agency of accident and nature of injury. Agricultural machinery accounted for the greatest percentages of amputations and cuts, with 54.0 per cent and 26.4 per cent of each category, respectively. Animals were involved most frequently for bruises (31.2 per cent), fractures (24.3 per cent), and multiple injuries (19.3 per cent). Power tools were associated with the greatest number of eye injuries (20.7 per cent) and hand tools accounted for large percentages of cuts, eye injuries, and puncture wounds (13.8 per cent, 14.9 per cent, and 17.4 per cent, respectively). For all agencies combined, cuts were the most frequent injury type, accounting for 23.8 per

cent of the total. Sprains were the next most common with 15.5 per cent, followed by fractures with 15.2 per cent and bruises with 12.4 per cent of the injuries.

Work injuries by nature of injury and part of body are shown in Table 9. Amputation injuries most often involved fingers (71.4 per cent) followed by hands (9.5 per cent) and feet (6.3 per cent). Bruises occurred most often to the leg, punctures to the foot, and burns to the hand and arms. Most often involved with sprains was the back with 39.8 per cent of the total, and feet with 16.0 per cent. Cuts were distributed among several body parts, lead by fingers (27.2 per cent), hands (20.1 per cent), head (18.7 per cent), and legs (12.8 per cent).

A distribution of work injuries by activity at time of accident is shown for each major type of agricultural operation in Table 10. Persons engaged in routine chores accounted for 24.5 per cent of all injuries, the greatest portion of the total, while field work was the next most common activity with 20.1 per cent. By type of agricultural operation, routine chores were the most common activity for beef and dairy farms. On dairy farms, this activity was associated with over 42 per cent of the total, much higher than the percentage for all farms combined. Field work was the most common injury activity for grain and fruit farms, representing 22.1 per cent of grain farm injuries and 63.1 per cent of fruit operation injuries. The variation in activity at time of injury for various agricultural operations probably reflects the activities most commonly performed for these operations.

Table 11 illustrates the relationship among location of accident, activity at time of injury, and agency of accident. The most common location of injuries was fields (20.0 per cent) or barnyards (19.1 per cent). Barns and farm buildings followed with 14.5 per cent and 13.2 per cent, respectively. As expected, activity varied greatly by location. Routine chores were the most common activity for barns, barnyards and driveways, yard and garden, and land locations. Field work was most common for fields,

and machinery maintenance was the most common injury activity in farm buildings.

By agency of accident, agricultural machines were the most common type overall. They were also the agency involved most often for the driveway, farm building, and field locations. Animals were the second most common agency overall, but they represented the highest percentage of injuries for barn, barnyard, and land locations. As expected, trucks and other vehicles were named most often for highway and road accidents.

The data in Table 12 illustrate the relationship between agency of accident and type of accident. Falls were responsible for almost 20 per cent of the cases on file. Struck by or against an object accounted for almost 17 per cent of the total, and caught in or between objects had almost 16 per cent.

For agricultural machinery accidents, the greatest number resulted from being caught in or between objects, while falls from different levels were the most common accident type for injuries involving tractors, trucks, and other vehicles.

Animal-related injuries were most often associated with being struck by or against an object. For hand and power tool injuries, the most common accident type was contact with a sharp object. Falls of both types accounted for 44.7 per cent of injuries associated with the agency of accident "none".

Seasonal variations were observed in the distribution of injuries by month (see Table 13). In general, injury levels remained low during the winter months, increased through spring, peaked during summer, and decreased again in fall. For all operation types, November through February combined accounted for about 25 per cent of injuries. March, April, September and October accounted for 34 per cent, and May through August almost 41 per cent.

By type of agricultural operation, fruit farms showed the greatest variation from winter to summer, with peaks in both May and August. Grain operations were characterized by a higher than

average May to July peak. Beef and dairy operations exhibited less extreme seasonal variation, but also demonstrated a summer peak in injury levels.

Table 14 shows the distribution of injuries by day of the week and time of day. Variations in these distributions followed patterns of normal activity for farmers. During the early morning hours, injury levels were low, but rose rapidly after 8 a.m. During the normal meal hours of 11 a.m. to 1 p.m., levels decreased. Injuries peaked again at 2 p.m., and dropped for the remainder of the day.

These hourly distributions showed little variation by day of week, with the exception of Sunday, which accounted for only 7.5 per cent of the classified injuries. More injuries occurred on Tuesdays (16.7 per cent) and Wednesdays (16.5 per cent) than any other days. Fridays and Saturdays accounted for fewer injuries, with 14.5 per cent and 14.6 per cent, respectively.

Environmental conditions did not appear to play an important role in the occurrence of work injuries in the survey. Most injuries occurred under what would be considered optimal environmental conditions. For example, about half of the injuries specifying outside temperature occurred between 51^0 F and 85^0 F. Only about 11 per cent occurred at temperatures below freezing, and about 14 per cent occurred at temperatures greater than 85^0 F. Most accidents also occurred during clear conditions, with about 85 per cent of the specified cases reported as occurring during clear weather. Rainy conditions were associated with only about 5 per cent of the accidents. Wind was also not an important factor, as only about 9 per cent of the specified cases had winds of 10 mph or more. Light conditions were reported as daylight in about 80 per cent of the cases.

Survey data were also available in slightly over half the cases regarding the consequences of injuries in terms of medical treatment, lost workdays and costs. In the majority of reported cases, professional medical advice and/or treatment was sought.

A single contact with a physician or nurse was reported for 32.1 per cent of the specified cases while 60.2 per cent required more than one contact. The remaining 7.7 per cent of the injury cases required no treatment or were treated at home. About 45 per cent of all injuries were treated at a doctor's office, while about 28 per cent were treated in hospital emergency rooms. The injured person was admitted to the hospital in about 9 per cent of the incidents.

Most injuries, about 71 per cent of the total, involved seven or fewer lost workdays. More than 11 per cent of the injuries resulted in lost time lasting one to three months. About 3 per cent of the cases reported a physical handicap after recovery from injuries, and 0.6 per cent were unable to return to agriculture following the accident. Another 1.5 per cent chose not to return to agriculture, although they were physically able to do so.

Cost information from the survey is of limited usefulness because it is not current and because the survey data were collected over a time period of many years. Nevertheless, it appears that costs associated with work injuries in the file have been kept quite low. Of those cases reporting medical cost information, about 75 per cent had costs less than $100. About 11 per cent exceeded $500 in medical costs. In almost 90 per cent of the specified cases, there was no expenditure for replacement labor.

TABLE 1
NUMBER OF FARMS IN SURVEY
BY STATE AND ACREAGE

STATE	ACREAGE						ALL FARMS
	1-49	50-99	100-199	200-499	500-999	1,000+	
Alabama	466	203	156	169	54	19	1,067
Arizona	37	16	23	35	22	72	205
Arkansas	294	262	342	510	386	294	2,088
California	279	111	100	121	65	107	783
Colorado	35	16	37	62	70	213	433
Connecticut	10	4	17	21	2	0	54
Delaware	39	23	51	76	58	23	270
Georgia	120	134	217	269	109	83	932
Idaho	271	210	378	605	356	422	2,242
Indiana	179	169	271	471	233	56	1,379
Iowa	77	156	647	1,696	496	71	3,143
Kansas	89	136	242	552	555	581	2,155
Maryland	173	187	334	372	123	42	1,231
Michigan	49	48	61	133	75	22	388
Missouri	332	267	435	565	264	62	1,925
Montana	16	7	28	63	71	384	569
Nebraska	7	16	58	447	347	316	1,191
New Hampshire	18	18	23	48	8	3	118
New Mexico	134	28	38	61	38	118	417
New York	72	78	262	690	214	35	1,351
Oklahoma	48	43	106	182	137	146	662
Oregon	181	71	108	139	92	131	722
Pennsylvania	102	234	570	548	83	12	1,549
South Carolina	206	240	220	267	122	98	1,153
South Dakota	12	6	33	156	211	177	595
Tennessee	232	252	314	360	131	91	1,380
Utah	166	192	232	305	120	176	1,191
Vermont	41	22	39	168	43	6	319
Virginia	52	71	101	116	54	38	432
Washington	106	67	107	105	69	109	563
Wisconsin	50	157	524	820	106	22	1,679
Georgia - II	74	63	185	325	187	126	960
Iowa - II	102	121	486	1,283	497	86	2,575
Kansas - II	53	49	114	264	304	423	1,207
Vermont - II	51	41	57	71	56	89	365
35-state totals							
Actual	4,173	3,718	6,916	12,075	5,758	4,653	37,293
Theoretical	10,162	5,344	6,992	8,376	3,644	2,775	37,293

TABLE 2
AGE DISTRIBUTION OF PERSONS,
WORK HOURS, AND WORK INJURIES
BY FAMILY STATUS AND SEX

AGE	FAMILY MEMBERS		HIRED HELP		ALL PERSONS
	Male	Female	Male	Female	
			Persons		
0-4	4.6	5.1	*	*	3.3
5-14	18.4	19.7	4.1	6.1	14.5
15-24	20.5	17.0	38.8	35.5	24.9
25-44	22.9	26.2	37.7	39.3	28.6
45-64	27.1	26.9	15.7	13.1	23.3
65+	6.5	5.1	3.7	6.0	5.4
Total	100.0%	100.0%	100.0%	100.0%	100.0%
All Ages	38.5	30.4	25.0	6.1	100.0%
			Work Hours		
5-14	4.7	5.9	1.3	5.3	4.3
15-24	15.8	11.5	31.4	32.8	18.1
25-44	33.8	38.0	43.0	43.8	36.6
45-64	39.2	40.0	20.5	16.0	35.5
65+	6.5	4.6	3.8	2.1	5.5
Total	100.0%	100.0%	100.0%	100.0%	100.0%
All Ages	59.7	20.1	18.2	2.0	100.0%
			Work Injuries		
5-14	7.0	7.1	1.7	2.8	5.9
15-24	17.5	14.5	41.0	33.3	22.1
25-44	34.3	32.8	37.4	47.2	35.0
45-64	35.1	40.0	16.4	16.7	31.6
65+	6.1	5.6	3.5	0.0	5.4
Total	100.0%	100.0%	100.0%	100.0%	100.0%
All Ages	64.8	13.2	20.2	1.8	100.0%

*Exposure data were not collected for nonfamily members under the age of 5.

TABLE 3
WORK INJURIES PER MILLION WORK HOURS
BY AGE, SEX, AND FAMILY STATUS

STATUS	SEX	AGE 5-14	15-24	25-44	45-64	65+	ALL AGES
Family	Male	32.6	24.0	22.0	19.4	20.4	21.7
	Female	15.8	16.5	11.3	13.1	15.8	13.1
	Total	27.6	22.6	19.1	17.8	19.5	19.5
Hired help	Male	28.7	29.0	19.3	17.8	20.4	22.2
	Female	*	17.7	18.8	18.2	*	17.4
	Total	22.7	27.8	19.2	17.8	19.2	21.7
Combined family & hired help	Male	32.3	25.9	21.2	19.2	20.4	21.8
	Female	15.2	16.8	12.1	13.3	15.1	13.5
	Total	27.2	24.4	19.1	17.8	19.5	20.0

*Insufficient data for rate calculation.

TABLE 4

WORK INJURIES PER MILLION WORK HOURS

BY ACREAGE AND FAMILY STATUS

STATUS	ACREAGE						ALL FARMS
	1-49	50-99	100-199	200-499	500-999	1,000+	
Family	21.7	17.4	19.5	21.4	18.7	16.3	19.5
Hired help	39.1	22.8	19.5	23.8	20.1	18.9	21.7
Combined family & hired help	24.9	18.3	19.5	21.7	19.0	17.2	20.0

TABLE 5
WORK INJURIES PER MILLION WORK HOURS
BY AGRICULTURAL OPERATION, FAMILY STATUS AND SEX

STATUS	SEX	AGRICULTURAL OPERATION					ALL FARMS
		Beef	Dairy	Grain	Fruit	Other	
Family	Male	26.0	22.6	22.4	10.9	18.5	21.7
	Female	14.3	15.1	14.0	15.0	8.5	13.1
	Total	22.8	20.6	20.3	11.9	16.3	19.5
Hired help	Male	27.4	31.9	19.4	30.5	14.3	22.2
	Female	*	42.8	*	29.4	9.7	17.4
	Total	27.2	32.5	18.5	30.3	13.7	21.7
Combined family & hired help	Male	26.2	24.3	21.9	23.7	17.2	21.8
	Female	14.5	16.0	13.7	22.6	8.7	13.5
	Total	23.3	22.3	20.1	23.5	15.6	20.0

*Insufficient data for rate calculation.

TABLE 6
AGE DISTRIBUTION OF WORK INJURIES
BY SEVERITY AND FAMILY STATUS

AGE	SEVERITY					ALL INJURIES
	Slight	Severe	Permanent	Fatal	Unknown	
Family Members						
5-14	6.9	7.0	4.3	10.5	12.1	7.0
15-24	19.0	16.5	15.9	10.5	6.9	17.0
25-44	35.5	33.7	30.5	21.1	32.7	34.0
45-64	33.3	36.7	39.1	42.1	43.1	36.0
65+	5.3	6.1	10.2	15.8	5.2	6.0
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
All Ages	28.0	67.4	2.2	0.6	1.3	100.0%
Hired Help						
5-14	1.2	1.9	0.0	0.0	14.3	1.8
15-24	43.2	39.2	30.0	37.5	28.6	40.4
25-44	36.4	38.8	40.0	62.5	42.9	38.2
45-64	16.6	16.7	20.0	0.0	7.1	16.4
65+	2.6	3.4	10.0	0.0	7.1	3.2
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
All Ages	38.3	58.1	1.1	0.9	1.6	100.0%
Combined Family and Hired Help						
5-14	5.3	6.0	3.8	7.4	12.5	5.9
15-24	25.8	20.9	17.7	18.5	11.1	22.1
25-44	35.8	34.7	31.7	33.4	34.7	35.0
45-64	28.6	32.8	36.7	29.6	36.1	31.6
65+	4.5	5.6	10.1	11.1	5.6	5.4
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
All Ages	30.2	65.4	1.9	0.7	1.8	100.0%

TABLE 7

WORK INJURIES BY SEVERITY,

AGRICULTURAL OPERATION AND AGENCY OF ACCIDENT

OPERATION OR AGENCY	SEVERITY					ALL INJURIES
	Slight	Severe	Permanent	Fatal	Unknown	
Agricultural Operation						
Beef	11.7	14.1	5.0	13.3	13.7	13.2
Dairy	21.9	23.2	28.8	13.3	15.1	22.7
Grain	19.0	18.6	21.2	20.0	23.3	18.9
Fruit	5.9	3.4	0.0	0.0	5.5	4.1
Other	41.5	40.7	45.0	53.4	42.4	41.1
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Agency of Accident						
Agricultural machinery	15.2	18.0	47.5	13.3	12.3	17.6
Animal	17.4	17.2	7.5	0.0	13.7	16.9
Hand tool	8.0	7.4	2.5	0.0	8.2	7.5
Power tool	5.0	4.6	10.0	0.0	1.4	4.7
Tractor	6.2	8.5	7.5	26.7	5.5	7.9
Truck	4.6	3.9	3.7	3.3	5.5	4.1
Other vehicle	12.8	9.0	7.5	13.3	10.9	10.2
None*	16.8	15.2	2.5	13.3	15.1	15.4
Other, unknown	14.0	16.2	11.3	30.1	27.4	15.7
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
All Injuries	30.2	65.4	1.9	0.7	1.8	100.0%

*These work injuries are associated with no agency. The majority are falls-related.

TABLE 8
WORK INJURIES BY NATURE OF INJURY
AND AGENCY OF ACCIDENT

AGENCY OF ACCIDENT	NATURE OF INJURY										ALL INJURIES
	Amputation	Bruise	Burn	Fracture	Cut	Eye Injury	Puncture	Sprain	Multiple	Other	
Agricultural machinery	54.0	17.0	6.7	15.5	26.4	14.0	8.5	10.2	16.5	16.6	17.6
Animal	4.8	31.2	0.0	24.3	11.3	2.3	7.6	17.2	19.3	17.9	16.9
Hand tool	1.6	3.9	0.0	2.1	13.8	14.9	17.4	3.6	3.8	6.4	7.5
Power tool	7.9	1.6	5.6	1.4	10.7	20.7	1.3	0.5	2.4	1.3	4.7
Tractor	6.3	8.9	12.2	11.3	5.2	6.3	0.9	8.8	15.6	6.6	7.9
uck	3.2	6.1	10.0	4.3	3.4	1.8	0.9	4.5	8.5	2.5	4.1
Other vehicle	6.3	8.7	10.0	9.3	8.6	10.8	19.2	10.7	12.3	10.6	10.2
None	0.0	12.4	4.4	16.9	7.9	9.9	26.3	27.9	12.7	17.7	15.4
Other, unspecified	15.9	10.2	51.1	14.9	12.7	19.3	17.9	16.6	8.9	20.4	15.7
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
All Agencies	1.5	12.4	2.2	15.2	23.8	5.4	5.5	15.5	5.2	13.3	100.0%

TABLE 9

WORK INJURIES

BY NATURE OF INJURY AND PART OF BODY

PART OF BODY	NATURE OF INJURY									ALL INJURIES
	Ampu-tation	Bruise	Burn	Fracture	Cut	Puncture	Sprain	Multiple	Other	
Arm	1.6	10.5	17.8	14.5	8.9	5.8	4.2	4.7	3.1	7.8
Back	0.0	7.7	1.1	3.8	0.4	1.4	39.8	3.3	8.8	9.7
Chest	0.0	7.1	2.2	9.7	0.7	0.9	0.6	2.4	2.1	3.2
Eye	0.0	1.6	6.7	0.2	1.2	0.4	0.0	0.5	29.1	6.2
Finger	71.4	3.7	2.2	9.3	27.2	6.3	1.9	9.0	12.6	12.9
Foot	6.3	12.0	4.4	15.7	3.6	50.0	16.0	6.1	4.9	11.4
Hand	9.5	4.9	20.0	6.4	20.1	13.4	2.2	5.2	5.5	9.3
Head	0.0	5.7	4.4	3.2	18.7	3.6	0.2	4.2	4.8	7.1
Leg	3.2	23.9	13.3	12.8	12.8	14.7	13.5	9.9	8.3	13.3
Shoulder	0.0	5.3	1.1	3.0	0.2	0.0	6.1	0.9	2.0	2.6
Multiple	1.6	6.3	18.9	4.6	1.3	0.4	3.1	47.2	3.6	5.9
Other	6.4	11.3	7.9	16.8	4.9	3.1	12.4	6.6	15.2	10.6
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
All Injuries	1.5	12.4	2.2	15.2	23.8	5.4	15.5	5.2	18.8	100.0%

TABLE 10
WORK INJURIES BY ACTIVITY
AND AGRICULTURAL OPERATION

ACTIVITY	AGRICULTURAL OPERATION					ALL OPERATIONS
	Beef	Dairy	Grain	Fruit	Other	
Routine chores	24.7	42.8	18.9	5.4	18.8	24.5
Field work	15.9	14.2	22.1	63.1	19.5	20.1
Machinery maintenance	10.0	10.3	15.1	7.1	14.9	12.9
Treating livestock	16.3	7.0	7.2	0.6	13.0	10.5
Building maintenance	6.3	5.7	9.3	2.4	5.9	6.4
Other	26.8	20.0	27.4	21.4	27.9	25.6
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
All Injuries	13.2	22.7	18.9	4.1	41.1	100.0%

TABLE 11

WORK INJURIES BY LOCATION,

ACTIVITY OF VICTIM, AND AGENCY OF ACCIDENT

ACTIVITY OR AGENCY	LOCATION										ALL LOCATIONS
	Barn	Barnyard	Driveway	Yard, Garden	Farm Building	Field	Highway, Road	House	Land	Other	
Activity											
Routine chores	54.4	34.8	30.5	16.0	22.2	5.1	12.6	10.6	18.9	15.8	24.5
Field work	2.7	6.5	11.9	7.2	3.3	70.7	23.5	0.0	17.1	9.4	20.1
Machinery maintenance	5.0	10.6	23.8	13.2	35.9	10.5	5.0	0.0	1.8	12.9	12.9
Treating livestock	18.3	24.1	1.4	2.8	2.0	1.7	3.4	0.8	18.0	8.7	10.5
Building maintenance	7.7	4.7	5.7	6.1	16.9	0.4	1.7	21.1	3.0	6.2	6.4
Other	11.9	19.3	26.7	54.7	19.7	11.6	53.8	67.5	41.2	47.0	25.6
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Agency of Accident											
Agricultural machinery	6.2	15.6	23.3	7.7	20.8	36.4	5.9	0.0	9.2	12.6	17.6
Animal	43.5	29.2	4.3	6.6	2.6	2.3	10.9	1.6	25.3	13.4	16.9
Hand tool	7.2	6.1	2.9	8.3	14.8	7.1	0.8	7.3	6.1	6.4	7.5
Power tool	2.7	1.5	2.9	11.1	9.8	.8	2.5	3.3	14.0	4.9	4.7
Tractor	1.3	7.4	13.8	6.1	6.1	.3	10.9	0.0	7.0	5.4	7.9
Truck	1.5	1.7	10.5	2.2	3.3	3.7	38.7	0.0	3.3	4.0	4.1
Other vehicle	6.0	9.2	10.9	16.6	9.6	10.0	20.2	7.3	9.2	14.9	10.2
None	19.5	15.5	17.6	19.9	15.6	12.3	6.7	22.0	13.7	14.4	15.4
Other, unknown	12.1	13.8	13.8	21.5	17.4	11.1	3.4	58.5	12.2	24.0	15.7
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
All Injuries	14.5	19.1	5.1	4.4	13.2	20.0	2.9	3.0	8.0	9.8	100.0%

TABLE 12
WORK INJURIES
BY AGENCY AND TYPE OF ACCIDENT

TYPE OF ACCIDENT	AGENCY OF ACCIDENT								ALL AGENCIES
	Animal	Agri-cultural Machinery	Hand, Power Tool	Tractor	Truck	Other Vehicle	None	Other	
Struck by, against object	37.2	11.7	17.5	16.4	23.1	13.4	7.4	9.8	16.8
Fall, different level	6.3	6.5	2.2	18.3	24.3	14.3	20.2	14.9	11.8
Fall, same level	5.8	2.6	1.6	2.2	2.9	4.8	24.5	11.9	8.1
Contact with sharp object	4.5	7.1	31.1	2.2	2.9	12.4	10.6	10.8	10.7
Caught between objects	12.1	18.3	5.4	14.5	7.7	7.9	2.7	5.0	9.4
Caught in object	1.9	20.8	3.8	6.5	2.9	4.1	1.1	4.5	6.3
Caught under object	7.9	7.6	0.4	12.7	5.3	5.0	1.1	2.3	5.0
Struck by falling object	0.4	8.6	6.2	3.1	2.4	7.4	3.5	5.0	4.7
Struck by flying object	3.3	3.2	14.0	3.4	2.4	1.7	1.9	3.2	4.2
Foreign object	0.6	2.5	8.4	0.9	0.6	4.1	4.7	3.7	3.4
Overexertion	1.6	3.2	3.8	1.2	1.8	4.1	6.3	5.4	3.7
Other	18.4	7.9	5.6	18.6	23.7	20.8	16.0	23.5	15.9
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
All Injuries	16.9	17.6	12.2	7.9	4.1	10.2	15.4	15.7	100.0%

TABLE 13
WORK INJURIES BY AGRICULTURAL OPERATION
AND MONTH OF OCCURRENCE

MONTH	AGRICULTURAL OPERATION					ALL OPERATIONS
	Beef	Dairy	Grain	Fruit	Other	
January	5.2	6.5	5.9	3.6	5.7	5.8
February	9.3	7.3	5.2	6.0	6.2	6.7
March	9.8	9.8	6.1	7.7	8.4	8.4
April	8.9	8.6	9.4	7.7	8.8	8.8
May	8.3	7.7	12.8	11.9	9.0	9.5
June	10.7	10.8	10.6	8.9	11.3	10.9
July	10.7	10.4	12.4	10.1	12.3	11.6
August	6.8	8.0	8.9	16.7	9.4	8.9
September	9.8	7.6	8.0	10.1	8.2	8.3
October	6.5	9.8	9.6	10.7	8.4	8.8
November	6.8	7.9	6.2	3.6	6.6	6.7
December	7.2	5.6	4.9	3.0	5.7	5.6
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
All Months	13.2	22.7	18.9	4.1	41.1	100.0%

TABLE 14
WORK INJURIES BY DAY OF WEEK
AND TIME OF DAY[a]

TIME OF DAY	DAY OF THE WEEK							ALL INJURIES
	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
1 a.m.	0.4	0.7	0.4	1.0	0.2	0.2	0.0	0.4
2 a.m.	0.0	1.5	1.4	0.8	1.8	1.1	1.4	1.2
3 a.m.	0.0	2.6	1.2	2.2	0.4	1.1	0.9	1.3
4 a.m.	3.5	3.1	1.6	1.4	0.9	1.6	0.9	1.7
5 a.m.	1.8	2.4	2.0	2.6	0.4	1.6	1.6	1.8
6 a.m.	2.7	2.0	2.2	2.0	1.8	2.3	2.5	2.2
7 a.m.	4.9	3.9	2.4	3.6	3.3	2.1	3.0	3.2
8 a.m.	8.9	3.5	4.[illegible]	2.8	3.8	5.5	3.2	4.2
9 a.m.	5.8	8.3	9.8	7.5	8.5	6.7	6.4	7.8
10 a.m.	11.5	14.3	16.3	10.3	13.3	10.6	13.7	13.0
11 a.m.	8.9	6.2	7.6	11.2	8.5	9.2	11.7	9.0
Noon	1.3	1.5	2.2	1.8	1.6	1.4	2.1	1.7
1 p.m.	1.8	4.6	4.6	4.1	4.0	3.9	5.7	4.3
2 p.m.	9.7	10.5	8.4	10.5	11.3	11.1	8.2	10.0
3 p.m.	12.4	6.6	8.8	11.2	11.3	[illegible]	8.7	9.5
4 p.m.	5.3	8.1	10.9	8.5	9.6	1[illegible]	1.4	9.6
5 p.m.	6.6	7.7	6.6	7.0	5.8	[illegible]	5.9	7.0
6 p.m.	5.8	4.4	2.6	6.3	4.4	3.7	5.7	4.6
7 p.m.	5.3	3.3	3.0	2.2	4.9	3.4	3.4	3.5
8 p.m.	2.2	2.6	1.0	0.8	2.0	1.8	1.6	1.7
9 p.m.	0.4	0.9	0.8	1.0	0.9	0.5	0.2	0.7
10 p.m.	0.4	0.2	0.0	0.2	0.2	0.9	0.2	0.3
11 p.m.	0.0	0.0	0.8	0.2	0.0	0.5	0.5	0.3
Midnight	0.4	1.1	1.2	0.8	1.1	1.1	1.1	1.0
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
All Injuries	7.5	15.2	16.7	16.5	15.0	14.5	14.6	100.0%

[a]Based on 2,997 classifiable cases. Cases are classified by nearest hour to exact time of accident.

Work Injury Scenarios

Scenarios were developed by first running a three-way crosstabulation of nature of injury by part of body by type of accident. The cells or cell combinations with the largest frequencies were identified and a crosstabulation of activity versus agency of accident was run for each. Then the most frequent combinations of activity and agency were noted for the given type of accident/nature of injury/part of body combinations. The scenarios are given in the following general format:

I. Type of accident (N_1)

   A. Resulting in [nature of injury] to the [part of body] (N_2) while performing [activity] involving [agency of accident] (N_3).

   B. Resulting in [nature of injury] to the [part of body] (N_4)

      1. while performing [activity] involving [agency of accident] (N_5).

      2. while performing [activity] involving [agency of accident] (N_6).

N_1 is the total number of cases of the accident type; N_2 and N_4 are the number of cases of the accident type/nature of injury/part of body combination; and N_3, N_5, and N_6 are the number of cases of the accident type/nature of injury/part of body/activity/agency of accident combination.

Reading I-A, I-B-1, and I-B-2 gives complete statements of three accident scenarios. If there are no cells or cell combinations in a particular crosstabulation that indicate a pattern, then that is stated in the scenario and the largest marginal frequencies may be identified instead.

The accident types and combinations of characteristics within each type are listed in decreasing order of frequency.

I. Struck By or Against Object (683)

A. Resulting in bruise or fracture to head (102)

1. while performing chores or treating livestock involving animals (22).
2. while performing field work or machinery maintenance involving hand tools (9).
3. while performing machinery maintenance or chores involving agricultural machinery (8).
4. while performing chores involving other vehicles (6).
5. while performing field work involving tractors (5).

B. Resulting in bruise or fracture to leg (62) while performing chores or treating livestock involving animals (28).

C. Resulting in bruise or fracture to chest (36) while performing chores or treating livestock involving animals (17).

D. Resulting in bruise or fracture to the arm (35) while performing chores or treating livestock involving animals (18).

E. Resulting in fracture or cut to hand (34) while performing chores or treating livestock involving animals (12).

F. Resulting in fracture or cut to finger (31) while performing field work or machinery maintenance involving agricultural machinery (9).

G. Resulting in eye injury to eye (20). No dominant pattern of activity and agency of accident.

H. Resulting in sprain to back (14) while performing chores or treating livestock involving animals (9).

I. Resulting in cut or puncture to leg (13) while performing field work or machinery maintenance involving agricultural machinery (12).

J. Resulting in sprain to leg (13) while treating livestock involving animals (6).

II. Fall, Different Level (486)

A. Resulting in bruise, fracture, or sprain to back (67)
   1. while performing chores involving none (17).
   2. while performing field work involving tractors or other vehicles (11).

B. Resulting in bruise, fracture, or sprain to arm (47)
   1. while performing field work involving agricultural machinery, tractors, or other vehicles (10).
   2. while performing chores involving none (7).

C. Resulting in bruise, fracture, or sprain to leg (45) while performing chores or field work (28) with no dominant agency of accident.

D. Resulting in bruise, fracture, or sprain to shoulder (25) while performing chores (8) with no dominant agency of accident.

E. Resulting in fracture to chest (17) with no dominant pattern of activity or agency of accident.

III. Contact with Sharp Object (439)

A. Resulting in cut or puncture to hand (99).
   1. involving hand tools (23) with no dominant activity.
   2. involving power tools (14) with no dominant activity.
   3. while performing field work or machinery maintenance involving agricultural machinery (12).
   4. while treating livestock involving animals (12).

B. Resulting in cut to finger (95)
   1. involving hand tools (26) with no dominant activity.
   2. involving agricultural machinery (15) with no dominant activity.

3. involving power tools (12) with no dominant activity.

C. Resulting in puncture to foot (82)
   1. while performing chores (36) with no dominant agency of accident.
   2. while performing building maintenance (19) with no dominant agency of accident.

D. Resulting in cut or puncture to leg (59)
   1. involving power tools (23) with no dominant activity.
   2. while performing field work (16) involving hand tools (7).

E. Resulting in cut to arm (33) with no dominant pattern of activity and agency of accident.

F. Resulting in cut to head (11) with no dominant pattern of activity and agency of accident.

IV. Caught Between Objects (385)

A. Resulting in amputation, cut, fracture, mangle, or pinch (139) while performing field work, machinery maintenance, or chores involving agricultural machinery (51).

V. Fall, Same Level (331)

A. Resulting in bruise, fracture, or sprain to leg (45) while performing chores (30) with no dominant agency of accident.

B. Resulting in bruise, fracture, or sprain to back (44) while performing chores (25) with no dominant agency of accident.

C. Resulting in fracture or sprain to foot (32) while performing chores (11) with no dominant agency of accident.

D. Resulting in bruise, fracture, or sprain to arm (28) while performing chores (13) with no dominant agency of accident.

VI. Caught In Object (261)

A. Resulting in amputation, cut, or mangle to finger (88) while performing field work, machinery maintenance, or chores involving agricultural machinery (44).

B. Resulting in cut to hand (28) while performing field work or machinery maintenance involving agricultural machinery (17).

C. Resulting in cut to leg (13) while performing field work (8) with no dominant agency of accident.

VII. Caught Under Object (205)

A. Resulting in bruise or fracture to foot or leg (55)

1. while performing field work or machinery maintenance involving agricultural machinery (12).
2. while performing chores or treating livestock involving animals (11).
3. while performing field work or chores involving tractors (8).

VIII. Falling Object (195)

A. Resulting in bruise or fracture to foot or toe (46) while performing machinery maintenance or chores involving agricultural machinery (9).

B. Resulting in cut to head (24)

1. involving other vehicle (8) with no dominant activity.
2. while performing field work, machinery maintenance, or chores involving agricultural machinery (6).

IX. Flying Object (171)

A. Resulting in eye injury to eye (74)

1. while performing machinery maintenance involving power tools or hand tools (24).
2. while performing field work (18) with no dominant agency of accident.

B. Resulting in cut to head (24) with no dominant pattern of activity or agency of accident.

X. Overexertion (152)

A. Resulting in sprain to back (84)

1. while performing chores (26), machinery maintenance (19), or field work (14) with no dominant agency of accident.
2. involving none (23), agricultural machinery (13), other vehicle (13) or hand tools (11) with no dominant activity.

B. Resulting in other injury to back (17) with no dominant pattern of activity and agency of accident.

XI. Foreign Object (139)

A. Resulting in eye injury to eye (73)

1. while performing field work (23) with no dominant agency of accident.
2. while performing machinery maintenance involving agricultural machinery, hand tools, or power tools (17).

B. Resulting in puncture to foot (13) with no dominant pattern of activity and agency of accident.

XII. Contact with Fire or Hot Object (44)

A. Resulting in burn to arm, finger, or hand (22) while performing machinery maintenance (8) with no dominant agency of accident.

Interventions

Agricultural safety leaders have used a number of methods for identifying and classifying injury control programs. One widely used method involves the three E's--Education, Enforcement, and Engineering.

Education is the responsibility of the safety educator. He or she can assist farmers and their families in understanding how to deal with work-related hazards around the farm and ranch by recognizing and eliminating them.

Enforcement or regulation is a phase of agricultural accident prevention that is not well accepted by the agricultural population. It requires individual behavioral changes or mandatory equipment modification for it to be effective (National Research Council Committee on Trauma Research, 1985). However, many voluntary standards and recommendations for agricultural regulations are supported and complied with by the agricultural industry.

Engineering provides automatic protection through design of equipment and the agricultural work environment. It attempts to provide the farmer and his employees with equipment and structures that are not only functional but also safe.

In recent years, much has been done to create safety consciousness in individuals during childhood when these habits can most readily be taught and accepted (Muckala, 1967). In addition, farm equipment manufacturers are giving more design priority to safe operation and maintenance aspects of farm machinery. Regarding engineering designs, a statement made by L. W. Knapp, Institute of Agricultural Medicine, State University of Iowa, in 1966, still seems applicable to our approach to agricultural safety today. Before a joint meeting of the Farm and Industrial Equipment Institute and the National Institute for Farm Safety, Dr. Knapp expressed the following:

> It is obvious the [farm] worker must of necessity work under a wide variety of environmental conditions and

> will go about his task in whatever way he thinks best for a given situation. Consequently, the worker must then be provided with the security he should provide for himself for his behavior pattern is not predictable. (Tanquary, 1966).

Safety and true accident reduction in the area of agriculture will come about by the realization that the weather will continue to be as unpredictable as ever and that in the pressure of getting his field work and chores accomplished, the farmer will not always follow safe practices or specified safety rules, no matter how well intended. These are the facts of agricultural life that are a challenge to those involved in farm safety who determine the product designs and changes in the man-made environment that will reduce agricultural accidents and injuries.

With this in mind, the following represents an inventory of possible countermeasures for the various agricultural work injuries discussed in this report. Most of the countermeasures listed consist of operating procedures that can be utilized by the farmer himself. As such they fall into the realm of education or enforcement countermeasures. Engineering countermeasures in the form of design changes can also be utilized by the farmer in many instances, but most must be implemented by equipment manufacturers.

The listing is arranged by accident type. Listed first are those accident types identified by the scenarios in the previous section as being most common. Within each accident type, countermeasures are given for the most common activities or agencies of accident identified by the scenarios.

Struck By or Against Object

To avoid being struck by or against livestock, facilities should be designed to permit treatment of livestock without entry into a pen or feedlot. If this is not possible, sturdy restraint equipment should be used. Adequate facilities should also be provided for loading and receiving animals. Milking parlors and other work areas should be provided with ramps where possible to facilitate handling of cattle. Escape gates (or man gates) should

be provided at yard corners or wherever an animal might be able to trap a handler. All animals should be treated with respect and patience. Sudden movements should be avoided and livestock handlers should wear protective headgear.

Countermeasures for being struck by or against agricultural machinery include always stopping the machine before dismounting or performing any adjustment or maintenance operation. Bump caps or hard hats should be worn.

For hand tools, countermeasures include wearing gloves and always choosing the proper tool. In addition, head gear and safety glasses should be worn.

To avoid being struck by or against an object in general, personal protective equipment should always be worn. These include gloves, bump caps or hard hats, eye protection, and safety shoes.

Fall, Different Level

To avoid different level falls while doing chores, work areas should be designed to reduce or eliminate the necessity to climb, especially on a daily basis. If climbing is unavoidable, ladder cages and roof entry platforms should be provided where needed. Acceptable housekeeping practices should be followed to reduce slippery surfaces, which may be caused by wet conditions from straw or other slippery materials being underfoot.

Countermeasures for different level falls while doing field work include not operating equipment at excessive speeds for the conditions under which it is being used. The operator's platform should be constructed of slip-resistant materials and kept free of mud or other slippery materials, and safety shoes with nonskid soles should be worn. Slip-resistant steps or ladders with good hand-holds should be provided for climbing onto machinery.

Contact with Sharp Object

Interventions for contact with hand tools include wearing proper gloves and safety glasses. Adequate lighting should be

provided in the work area. For power tools, gloves and goggles or glasses should also be worn. The power tool should be properly supported at all times.

To avoid injuries due to contact with agricultural machinery, the PTO should always be disengaged before dismounting from the tractor or other self-propelled equipment. Tractors and other machines should not be operated except from the operator's platform. All safety shielding should be kept in place at all times while the machine is in operation. Shielding should also be provided when working in and around knives or other sharp objects.

Countermeasures against contact with sharp objects while doing chores include the provision of safe working conditions by following good housekeeping practices. Safety shoes with puncture resistance soles should be worn.

Caught Between Objects

To avoid being caught between agricultural machinery and other objects, the PTO should be disengaged before dismounting from the operator's platform. Safety shielding should be kept in place while operating all equipment. Proper guarding should be provided for all mechanical feeding equipment. Work should not be attempted under hydraulically supported or controlled equipment unless it is adequately blocked or locked into position. "Lock-out" techniques should be utilized to prevent accidental engagement of a machine or other feed handling equipment. Electrical power should be disconnected to prevent automatic operation of timer-operated functions while performing servicing or repairing operations.

Fall, Same Level

Interventions for same level falls while doing chores include the design of the work area without steps, using ramps where possible, and construction using slip-resistant materials. Travel paths that do not interfere with animal movement should be provided, along with adequate lighting for dusk or night

conditions. Slippery surfaces or wet conditions with straw or other slippery material underneath should be eliminated or reduced. Slip-resistant footwear should be worn.

Caught In Object

To avoid being caught in agricultural machinery, safety shielding should be kept in place. Tractors or other machines should not be operated except from the operator's platform.

Caught Under Object

Countermeasures for being caught under livestock include wearing safety shoes when working around cattle, utilizing restraint devices when treating livestock, and providing adequate lighting for dusk or night work.

To avoid being caught under agricultural machinery or tractors, tractors should be equipped with rollover protective structures and seat belts. Safe working conditions should be maintained such as keeping the operating platform free of mud or other slippery materials. Slip-resistant shoes should be worn. Machines should not be operated at excessive speeds for the conditions under which they are being used. Tractor overturns can be reduced by spreading tractor wheels as wide as possible. Operators should exercise special caution when operating on slopes, rough ground, and near ditches or embankments.

Falling Object

To avoid being struck by falling objects when operating agricultural machinery, safety shoes and protective headgear should be worn. Proper tools should be used and kept properly positioned to avoid being dropped on operators or others in the work area.

Flying Object

To avoid being struck by a flying object when engaging in machinery maintenance or field work, safety glasses or goggles should be worn to protect the eyes. Bump caps or hard hats should

be worn to protect the head.

Overexertion

Countermeasures for overexertions include utilizing recommended lifting techniques, and providing mechanical or hydraulic lift devices where applicable.

Foreign Object

Interventions for being struck by a foreign object while engaged in machinery maintenance or field work include protecting the operator with personal protective equipment such as safety shoes, goggles, or safety glasses. Good housekeeping practices should also be followed.

Contact with Fire or Hot Object

To avoid being injured by contact with fire or hot object while doing machinery maintenance, protective clothing should be worn. Mechanical shielding should be provided where possible.

Discussion

The work injury rate computed from the 35 state surveys (20.0 per million work-hours) is consistent with injury rates reported in other summaries of the surveys. An 18-state summary reported a rate of 18.2 (Hanford, Burke, Fletcher, Recht, Hoskin, & Miller, 1979), and a 31-state summary reported a rate of 19.1 (Hanford, Burke, Fletcher, Hoskin, & Miller, 1982). It is also consistent with rates reported in individual state surveys. Michigan found a rate of 20.5 (Hofmeister & Pfister, 1968); the Nebraska rate was 27 (Schnieder, Florell, Baker, & Lorah, 1972); Williams (1983) computed a rate of 21.2 in Iowa; and the rate found by Jester (1985) in Wisconsin was 15. Rates found in earlier nonstandardized surveys were much higher -- 40 per million work-hours in Pennsylvania (Pennsylvania Dept. of Public Instruction, 1957) and 63 in Missouri (Gadalla, 1962) -- but it was not clear what definition of injury was used for the Pennsylvania survey and the Missouri survey included accidents resulting in property damage as well as injury.

The only other source of work-injury incidence rates in agricultural production is the Bureau of Labor Statistics (BLS). Incidence rates for agricultural crop production (Standard Industrial Classification [SIC] 01) were first published for 1973. Rates for agricultural crop and livestock production (SIC 01-02) were published from 1975 to the present, but exclude farms with ten or fewer employees. There are two incidence rates of interest: total cases and lost workday cases. Lost workday cases include occupational injuries that involve days away from work (days on which the person would have worked but could not) or days of restricted work activity (days on which the person worked but was temporarily reassigned, worked part-time, or could not perform all duties normally connected with the regular job). Total cases include lost workday cases plus cases without lost workdays involving loss of consciousness, restriction of work or motion,

transfer (permanent) to another job, or medical treatment (other than first aid).

The differences in injury definitions between the state farm surveys and the BLS surveys make it difficult to compare the two directly. The state surveys seem to include more than lost workday cases (e.g., medical care is included) but less than total cases (e.g., loss of consciousness and restriction of work or motion are not included). The state survey rates then ought to lie between the two BLS rates. This is not the case, however. BLS rates for total cases (after adjusting to the million hour base) were 52.0 in 1975, 62.5 in 1980, and 61.0 in 1985. The rates for lost workday cases were 22.0 in 1975 and 30.5 in both 1980 and 1985 (BLS, 1979, 1982, 1987). The state survey rate was 20.5 -- less than the lost workday case rate.

The most plausible reasons for the lower state survey rate are some of the same reasons cited by Field (1980) that make the farm work environment unique: the psychological stresses, financial pressures, and deadlines. Self-employed farmers, in order to complete their work, probably ignore minor injuries that would result in a recordable case for a hired worker covered under the BLS survey. Even though 92 per cent of work injuries in the state farm surveys required medical treatment, only 74 per cent resulted in one or more lost workdays and only 14 per cent used hired replacement labor. In contrast, about half the injuries in the BLS annual survey result in lost workdays -- meaning that a higher ratio of minor to severe cases is found in the BLS data.

On the basis of work injury rates per million hours of exposure from the farm surveys, 25-44 year old family females are at the least risk of injury (11.3) and family males aged 5-14 years are at the greatest risk (32.6). The injury rates of other family age-sex combinations and all hired help age-sex combinations fall between these two extremes. The high risk of injury to children under 15 is supported by the surveys in New York, Nebraska, and Iowa. All reported that children under 15 (or 5-14) years of age

had the highest injury rates (Hoff, 1970; Schnieder, Florell, Baker, & Lorah, 1972; and Williams, 1983). Much of the differences among the injury rates of the age-sex-employment groups probably can be explained by the kinds of tasks each group performs. Males probably perform the more physically demanding or risky jobs and the higher rates among young males are probably related to lack of experience.

These hypotheses, however, cannot be tested without some knowledge of the distribution of total work hours by specific tasks or activities. Gadalla (1962) and Doss and Pfister (1973) estimated injury rates per million hours of use for tractors and machinery, but they did not report rates for age-sex-employment groups. Doss and Pfister did report, however, that tractor and machinery operators under 15 years of age and over 65 (with male and female, family and hired combined) had the highest injury rates. Both studies found that the tractor-related injury rate was lower than the all-injury rate and that the machinery-related rate was greater. No studies were identified that estimated injury rates for tasks not involving the use of agricultural machinery or tractors.

The available data on work injury rates by age indicate that males under 15 are at great risk of work injuries on the farm. A special effort should be made to reduce the injuries to this age group. In addition to educational material and training aimed at this group (and their parents), special attention should be given to engineering interventions aimed at the equipment most commonly used by these people and the tasks which they most commonly perform. The equipment they use may need to be ergonomically re-designed to accommodate the smaller stature of pre-teens and adolescents.

There is no agreement among various studies on the influence of size of farm on work injury rates. The distribution of rates in the 35 surveys was bimodal with peaks at 1-49 acres and 200-499 acres. The lowest rates were at 50-99 acres and 1,000 or more

acres (Table 4). This is in contrast to the Iowa study in which Williams (1983) found that rates were highest for large farms and lowest for small farms. In Nebraska, on the other hand, there was no significant difference in injury rates by size of farm (Schnieder, Florell, Baker, & Lorah, 1972).

The BLS finds that rates generally increase with farm size as measured by the number of employees (BLS, 1987). There was very little variation, however, in the number of employees per farm as a function of acreage in the 35 state surveys. The smallest farms (less than 50 acres) averaged 1.3 employees and the largest (1,000 or more acres) averaged only 2.5 employees. Most farms in the surveys would fall into the smallest BLS size class (1-19 employees).

Fruit and beef operations had the highest work injury rates in the 35 state surveys--23.5 and 23.3 per million work-hours, respectively. High rates on beef farms agrees generally with the data reported by Nebraska and Iowa, where there were only two fruit farms out of 6,909 farms in these surveys. While fruit farms had a high total injury rate, the average severity of injuries on fruit farms was much less than on other types of farms. Only 54 per cent of injuries on fruit farms were severe, and no permanent or fatal injuries were reported, while on beef farms 70 per cent were severe and 1.5 per cent were permanent or fatal. Dairy farms also had a higher than average injury rate and a much greater proportion of permanent and fatal injuries--2.9 per cent.

The agency involved in the accident is of considerable importance in defining risks and interventions. As the object or substance most closely associated with the injury event, it is the logical target for prevention measures. The many studies of farm work injuries over the last 30 years are in general, though by no means unanimous, agreement on the relative importance of various agencies.

Studies of workers' compensation cases generally list working surfaces as the leading agency followed by vehicles, tools, or

miscellaneous objects (Burkart & deGroot, 1975; Burkart, deGroot, & Wolfenson, 1976; New York Dept. of Labor, 1972; and California Dept. of Industrial Relations, 1978). The coding system most commonly used by workers' compensation authorities (ANSI Z16.2-1962(R1969), Method of Recording Basic Facts Relating to the Nature and Occurrence of Work Injuries) includes tractors with other vehicles.

Studies of physician, clinic, or hospital records list animals, tractors, and farm machinery as the leading agencies (Peterson, 1973; and Cogbill & Busch, 1985).

Studies that examined data on deaths found agricultural machinery (including tractors) to be the leading agency (Fritsch, 1976; Fritsch & Zimmer, 1980; and Baker & Stuckey, 1973), although autos (Wardle & Hull, 1975) and trucks (California Dept. of Industrial Relations, 1978) were sometimes liste first.

Five of ten state surveys for which results were cited in the literature review found machinery to be the most common agency. Three found animals; one tools; and one fall-related agencies. The 35-state summary in this report ranks farm machinery as the leading agency followed by animals, none, hand and power tools, vehicles, and tractors.

There is bound to be some variation in the relative importance of the agencies involved in farm work injuries as reported in various studies because of the different sources of data, kinds of cases included, and mixtures of agricultural operations in the population covered. We can conclude, however, that certain agencies are more important than others and merit special attention to reduce their involvement. These are agricultural machinery, animals, hand and power tools, tractors, vehicles, and working surfaces.

The link between the agency and the injured person is the type of accident. It tells how the person was involved with the agency. Burkart, deGroot, and Wolfenson (1976) found that struck by or against, overexertion, falls, and caught in, between, or under were

the predominant accident types in the workers' compensation data they examined. Falling, both on the same level and on different levels, was the leading accident type in several state surveys. And in the 35 state summary reported here, caught in, between or under ranked first, followed by falls and struck by or against.

The nature of injury and part of body injured tell what happened when the agency and victim became involved in the accident. The results naturally depend on the particular agency and type of accident combination, as shown in the scenarios, but the most common combinations were (a) cut to fingers, hands, and head, (b) sprains to the back, (c) fractures of the foot, arm, or leg, and (d) bruises to the leg. It is apparent that personal protective equipment in the form of gloves, hard hats or bump caps, and safety shoes could provide immediate protection from injury in many situations. Engineering solutions, while more desirable, would take longer to implement and require greater capital investment.

Where the agencies of accident were being used and the kind of activity being performed were also important in characterizing farm work injury problems. Two thirds of all the injuries occurred in four locations: field, barnyard, barn, and farm building. Similarly, two thirds of all injuries resulted from four general activities: routine chores, field work, machinery maintenance, and treating livestock. Routine chores are, primarily, activities of a daily nature that involve feeding and manure removal for animals. Chores include the preparation and distribution of feed by breaking up hay bales or unloading silage and using conveyors or wagons to move the feed to the animals. On farms with dairy cattle, chores also include milking the cows.

In the fields, the majority of injuries involve machinery and tractors while performing field work such as plowing, planting, cultivating, and harvesting. In farm buildings, machinery maintenance and routine chores account for more than half of the injuries. While in the barn and barnyard, routine chores involving

animals lead to most injuries.

Machinery-related injuries most often result from being caught in, between, or under some part of the machine. Nearly half of all machinery injuries happen this way.

About half of all animal-related injuries occur in one of two ways. Thirty-seven per cent result from being struck by or striking against, and another 12 per cent from being caught between. Hoskin and Miller (1979) have noted that caution in approaching animals so as not to startle them and proper securing of animals can be important means of reducing animal-related injuries.

Nearly one third of all hand and power tool injuries result from contact with a sharp object. Another one third result from being struck by or striking against and being struck by a flying object. There are many possible reasons for tool-related injuries. Choosing the wrong tool for the job, using a tool that is dull or broken, working in a confined area or awkward position, working on improper or defective materials, not knowing safe job procedures, or not wearing the proper personal protective equipment can all contribute to tool-related injuries.

There are four accident types involving tractors that are of about equal importance and together account for nearly two thirds of tractor-related injuries. Falls accounted for 18 per cent of the tractor-related injuries; struck by or against accounted for 16 per cent; caught between for 15 per cent; and caught under for 13 per cent.

More than half of the injuries involving agricultural trucks were of two types: falls from one level to another and struck by or against. Since about one fourth occurred on roads and highways, many of the struck by or against accidents were traffic accidents.

"None" as the agency involved in the accidents is difficult to interpret. But with 45 per cent of the "none" injuries resulting from falls (20 per cent from one level to another and 25 per cent on the same level) it seems that "none" refers to working

surfaces as the agency in these cases. In the remaining cases an object was clearly associated with the type of accident and should have been named as the agency. The lack of an "other" category for this question probably led respondents to interpret "none" as meaning not elsewhere classified. The "other" category used in tabulations of the agency is an amalgam of the specified categories not listed separately.

The work injury scenarios were constructed to define the most common hazard patterns in farm work as documented in the 35 state farm surveys. The various combinations of type of accident, nature of injury, part of body, agency, and activity, taken together, create "snapshots" of the injury events. The pictures are not completely clear because some elements of the scenes are not defined. But sufficient information is present to suggest a number of possible countermeasures as set forth in the section on interventions. The scenarios were presented in descending order of importance as measured by the frequency of injury. Interventions aimed at the high ranking scenarios should be considered first for implementation because they have the greatest potential benefits.

A broad range of possible interventions are given -- some may be practical and some may not. Each one needs to be examined to assess its value in an overall injury prevention program. Although all three types of interventions have a place in a comprehensive injury prevention program, preference should be given first to engineering interventions, second to enforcement interventions, and third to educational interventions. Research has shown that engineering approaches are more effective than enforcement, and enforcement more effective than education (National Research Council Committee on Trauma Research, 1985). Many factors must be considered in evaluating each potential intervention. Among those factors are potential effectiveness, cost (and who pays), feasibility, effect on productivity, time required to begin implementation, time required for full implementation, and

acceptability by those affected.

It is essential, too, to plan for administrative and effectiveness (impact) evaluations of the interventions that are finally implemented. The fact is that there has been virtually no formal evaluation of injury prevention measures on the farm. The extensive literature review undertaken for this study identified only a few research reports that could be considered to be evaluations. McCarthy, Robinson, and Brand (1985) examined the injury rates associated with three hay baling technologies. Sell and Field (1984) surveyed the usage of three PTO master shield designs. And a few studies such as Buckingham (1981) and Schnieder (1983) have drawn conclusions about the effectiveness of ROPS based on the time trend of tractor overturn-related deaths. None of the studies reviewed, however, were true evaluations.

A systematic, scientific approach to the farm work injury problem consisting of injury data analysis and intervention selection, implementation, and evaluation will bring about the most effective results and the most prudent use of limited resources.

Some areas for further research are suggested by the analysis and discussion of farm work injuries. More detailed data on the amount of exposure to various tasks, agencies, or activities would greatly increase our ability to interpret the injury frequency data and thus would increase our understanding of it. Our ability to prioritize the injury scenarios would also be enhanced. Doss and Pfister (1972) and Cadalia (1962) established the feasibility of obtaining detailed machinery and tractor exposure data through diaries. The same concepts would be applied to exposure to tasks or activities.

It may also be desirable to expand the scope of study to include more than the usual reportable injuries. Injuries are very rare events and it requires a great deal of effort and resources to collect enough cases to study. By expanding the area of interest to include minor injuries, "near misses," and even "errors," more data can be collected at the same cost, and a better

understanding can be had of how "forgiving" various kinds of hazardous conditions and unsafe acts can be.

It is also very important to collect data on the particular makes and models of tractors and machinery. There is a wide variety of equipment available with various designs and features. For example, according to the Implement & Tractor "Red Book," more than 300 tractor models are made by 24 manufacturers, there are 43 combine models offered by 12 manufacturers, and 73 models of balers made by 17 manufacturers. It is impossible to tell from the injury data whether the injury was attributable to a design element common to all machines of the given type or if it was due to an element unique to one model or manufacturer. Knowing this would directly influence the choice of intervention strategies.

Napier, Goe and Pugh (1985) suggested that attention should be given factors not usually studied. They postulated several factors that could be important: ecological factors associated with accidents, timing of accidents, psychosocial orientations, and fatigue. They had found that more traditional factors were not strong predictors of injury frequency.

We agree that most studies of traditional factors have yielded as much information as can be expected and that a new approach is needed. It is necessary now to identify true causal factors that produce injuries. This means not just identifying a hazardous condition associated with an injury but finding out why it was not recognized or corrected. It means finding out if the person knew the safe way to perform the job and why he or she deviated from that procedure. It means finding out if training and supervision were adequate, and if not, why not. Knowing the true causes of injuries will lead to more effective interventions.

The National Safety Council developed a systematic procedure for identifying causal factors and corrective actions (National Safety Council, 1983). It was developed for use primarily in an industrial setting but could be adapted for use in the farm environment. The procedure consists of a series of yes/no

questions that guide the investigator through four areas: (a) equipment, (b) environment, (c) people, and (d) management. The questions focus the investigator's thinking on generic causal factors and provide an opportunity for him or her to list the specific causal factors that apply to the case being investigated. By systematically answering all of the questions, the investigator notes all possible contributing factors rather than stopping after one, two, or three. The structured procedure also permits the tabulation and analysis of statistics on the incidence of causal factors.

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APPENDIX A

FARM SURVEY FORMS

MASTER DATA SHEET

Form No. NSC-F1

1-2

GENERAL INFORMATION

HOUSEHOLD IDENTIFICATION NUMBER

3-4 County No. 5-6 Interviewer No. 7-8 Household No.

Date of Interview _____

Read instructions before filling out the form below.

1. Fill-in your County No. and Interviewer No. as requested. Acceptable households are to be numbered consecutively.
2. The ID Number assigned to this household is to be used for identifying accident and all supplemental reports filed from this location.

Farm Discription:

____ Yes ____ No (A) Consists of 10 or more acres and sells $50.00 or more of agricultural products annually.

____ Yes ____ No (B) Less than 10 acres and sells $250.00 or more of agricultural products annually.

9-13 _____ Acres (C) Total acres (Owned and/or rented from another party.)

IF ANSWERS TO BOTH QUESTIONS (A) AND (B) ARE "NO," STOP AND GO TO THE NEXT FARM/RANCH!

1. Name of head of household--farm/ranch operator performing agricultural operations. (Insert name on Interviewer's Household ID List.)
2. Address and Phone No.(Insert information on Interviewer's Household List, also.)
3. Average no. of hours/week household head devotes to farm/ranch -- 14-15 _____ hours
4. Number of years household head spent on farm/ranch ---------- 16-17 _____ years
5. Total number of years person listed as #1 attended school ------- 18-19 _____ years
6. Total number of family members living on farm(include only those living at home more than 6 months each year) ---------- 20-21 _____
7. Interviewer to complete the table below:

TABLE NO. 1 -- Number of FAMILY MEMBERS Living/Working on Farm/Ranch By Age & Sex During the Survey Period

SEX	MALE						FEMALE					
AGE OF FAMILY MEMBERS	0-4	5-14	15-24	25-44	45-64	65 & over	0-4	5-14	15-24	25-44	45-64	65 & over
Number by Sex in Each Age Group	22	23	24	25	26	27	28	29	30	31	32	33
Equivalent No. 10-Hr. Days Worked on Farm/ Ranch by each Group*	34-37	38-41	42-45	46-49	50-53		54-57	58-61	62-65	66-69	70-73	

* Equivalent 10 hour days worked obtained from table (Fig. 39) included with Interviewer's Instructions.

80,1

Revised 5/22/75

Table No. 2 -- Number of HIRED HELP Living/Working on Farm/Ranch by Age & Sex During the Survey Period *

SEX	MALE						FEMALE					
AGE OF HIRED HELP MEMBERS	0-4	5-14	15-24	25-44	45-64	65 & over	0-4	5-14	15-24	25-44	45-64	65 & over
Number by Sex in Each Age Group	09	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29	30-31
Equivalent No. 10-Hr. Days Worked on Farm/Ranch by each Group		32-35	36-39	40-43	44-47	48-51	X	52-55	56-59	60-63	64-67	68-71

* When possible, include migrant workers and other temporary workers expected to be employed during the Survey Period.

8. From list below, select the major plus 2nd and 3rd important farming or ranching operations if more than one type is considered important.

72-73_____ Major type; 74-75_____ 2nd in value; 76-77_____ 3rd in value. 80,2
(Insert number identifying operation in space provided)

01 Alfalfa	09 Dairy	17 Nursery	25 Sugar beets
02 Beef	10 Deciduous Fruit	18 Nuts	26 Sugar cane
03 Citrus	11 Feedlot	19 Poultry	27 Tobacco
04 Container plants	12 Field flowers	20 Range cattle	28 Truck crop
05 Corn	13 Fruit	21 Rice	29 Vegetable crop
06 Cotton	14 Grain Sorghum	22 Seed crops	30 Other, specify
07 Cow-Calf	15 Hogs	23 Small grains	_____
08 Cut Flowers	16 Horses	24 Soybeans	

9. How many of the following pieces of equipment, in running order, do you have on your farm or ranch? (Put "0" if none, "1" if one, "2" if two, and so forth)

09 __ Airplane	23 __ Forage Harvester	37 __ Mower(w/cutterbar)
10 __ Bale Wagon/Roadsider	24 __ Harvester(fruit)	38 __ Mower, rotary
11 __ Bed Shaper	25 __ Harvester(vegetable)	39 __ Pruning Equipment(power)
12 __ Chisel Plow	26 __ Hay Baler	40 __ Skiploaders/Forklift
13 __ Combine	27 __ Hay Cuber	41 __ Sprayer/Duster
14 __ Corn Picker	28 __ Hay Stacker	42 __ Sugarbeet Harvester
15 __ Cotton Picker	29 __ Implement Carrier	43 __ Tractor, Crawler
16 __ Cotton Stripper	30 __ Irrigation Equipment	44 __ Tractor, Garden
17 __ Cultivator	31 __ Ladders	45 __ Tractor, Wheel
18 __ Disc Harrow	32 __ Landleveling equipment	46 __ Tractor Mtd. Posthole Digger
19 __ Disc Plow	33 __ Moldboard	47 __ Truck
20 __ Elevator(portable)	34 __ Manure Spreader	48 __ Wagon
21 __ Feed Grinder &/or Mixer	35 __ Mower/Chopper(flail)	49 __ Wagon, self-unloading
22 __ Fertilizer Spreader	36 __ Mower-crusher	50 __ Windrower
		51 __ Other, _____ (specify)
		52 __ Snowmobile 80,3

During the past three months has any person living, working or visiting on this farm/ranch had an accident?
_____ YES _____ NO

If answer is "Yes," proceed to accident report form and the appropriate supplemental report form, if applicable. Complete separate form(s) for each victim.

DATE EDITED_____

MASTER DATA SHEET--GENERAL INFORMATION

Form NSC-F1
Rev. 79-2

INSTRUCTIONS: The ID number assigned to this household must be used in all reports concerning this farm or ranch.

Household IDentification Number:

Form: F1 (1-2)

1. Fill in your County number . . . . . County:_____ (3-4)

2. Fill in your Interviewer number . . . . . Interviewer:_____ (5-6)

3. If this place qualifies as a farm/ranch by answering "yes" to question 1A or 1B or 1C, then enter the name, address, and telephone number of the head of household on your Household IDentification List and write the Household ID Number here . . . . . Household:_____ (7-8)

4. Enter the date of this interview . . . . . Date:_____

If the answer to the following question is obvious, then check the appropriate box and follow the directions:

1A. Does this place produce more than $1,000 in agricultural products annually?

(10-11) 01 ☐ Yes -- Go on to Question 2.

02 ☐ No -- The place may still qualify as a farm if the answer to one of the next questions is "yes." Ask them if you are not sure.

1B. Does this place consist of 10 or more acres and sell $50 or more or agricultural products annually?

☐ Yes -- Go on to Question 2.

☐ No -- Go to Question 1C.

1C. Does this place consist of less than 10 acres and sell $250 or more of agricultural products annually?

☐ Yes -- Go to Question 2.

☐ No -- STOP. This place does not qualify as a farm/ranch for this survey. Go on to the next household on your route.

2. Interviewer: Be sure that you enter the name, address, and telephone number of the head of household on your Household IDentification List and that the number from that list is correctly copied in the number above.

3. How many acres does this farmer/rancher operate?

(12-13) 01 ☐ 1-49 acres

02 ☐ 50-99 acres

03 ☐ 100-199 acres

04 ☐ 200-499 acres

05 ☐ 500-999 acres

06 ☐ 1,000 or more acres

4. Estimate the total number of man-hours to be worked by contract labor during the one-year survey period. (Do not include hired help or exchange labor; see reverse.)

(14-19) _____ man-hours.

5. Circle the code number and name of the agricultural operation listed on the right of this page that contributes most to the total value of sales of agricultural products from this farm/ranch. If in doubt about the correct classification, just write down the primary crop at the end of the list.

6. Turn this sheet over and complete the information about hours of exposure for people who work on this farm/ranch.

CODE (20-21)	CROP DESCRIPTION
	CASH GRAINS
01	wheat
02	rice
03	corn
04	soybeans
05	other cash grain crops
	FIELD CROPS
06	cotton
07	tobacco
08	cane sugar
09	field crops for seed
10	other field crops, including beet sugar, Irish potatoes, field crops for hay, peanuts, and sweet potatoes
11	VEGETABLES AND MELONS, including truck crops
	FRUITS AND NUTS
12	tree fruit and nuts
13	other fruits, not tree
14	HORTICULTURAL SPECIALTIES, including flowers, plants, shrubs, seeds, bulbs, and food crops grown under cover
	LIVESTOCK
15	beef cattle
16	hogs
17	sheep and goats
18	general livestock
19	DAIRY FARMS
20	POULTRY AND EGGS
	ANIMAL SPECIALTIES
21	horses and ponies
22	other animal specialties, including fur-bearing animals, rabbits, burros, donkeys, and mules
23	FOREST PRODUCTS, including timber tracts and tree farms
24	COMMERCIAL FISH, including finfish, shellfish, miscellaneous marine products, fish hatcheries and preserves

Write the primary crop here if you don't know where to classify it in the list above.

_____

Complete the following lists which show the persons exposed to farm work and approximately how much work they will do during the survey period. Use the Family Member and Hired Help sections to list the workers with whom you are acquainted.

FAMILY MEMBERS

First name or initials:	Age in years:	Sex (check one box):	Average hours of farm work on days that this person works:	Total number of days this person will work during the one year survey period:
	(10-11)	(12-13)	(14-15)	(16-18)
	☐	11 ☐ Male 12 ☐ Female	☐	☐
	☐	11 ☐ Male 12 ☐ Female	☐	☐
	☐	11 ☐ Male 12 ☐ Female	☐	☐
	☐	11 ☐ Male 12 ☐ Female	☐	☐
	☐	11 ☐ Male 12 ☐ Female	☐	☐
	☐	11 ☐ Male 12 ☐ Female	☐	☐
	☐	11 ☐ Male 12 ☐ Female	☐	☐
	☐	11 ☐ Male 12 ☐ Female	☐	☐
	☐	11 ☐ Male 12 ☐ Female	☐	☐
	☐	11 ☐ Male 12 ☐ Female	☐	☐
	☐	11 ☐ Male 12 ☐ Female	☐	☐
	☐	11 ☐ Male 12 ☐ Female	☐	☐
	☐	11 ☐ Male 12 ☐ Female	☐	☐
	☐	11 ☐ Male 12 ☐ Female	☐	☐
	☐	11 ☐ Male 12 ☐ Female	☐	☐

Use this section to account for the hired help you will use with whom you are not acquainted. Use your best judgement when estimating the age, sex, and hours of exposure for these workers.

Age and sex group:	Code:	Number of people in each age and sex group:	Average number of hours each person will work on days that they work:	Number of days each of these people will work during the one year survey:
	(10-13)	(14-15)	(16-17)	(18-20)
MALES				
5-14 yrs	1031	☐	☐	☐
15-24 yrs	2031	☐	☐	☐
25-44 yrs	3531	☐	☐	☐
45-64 yrs	5531	☐	☐	☐
65 & over	6531	☐	☐	☐
FEMALES				
5-14 yrs	1032	☐	☐	☐
15-24 yrs	2032	☐	☐	☐
25-44 yrs	3532	☐	☐	☐
45-64 yrs	5532	☐	☐	☐
65 & over	6532	☐	☐	☐

HIRED HELP (including exchange labor)

First name or initials:	Age in years:	Sex (check one box):	Average hours of farm work on days that this person works:	Total number of days this person will work during the one year survey period:
	(10-11)	(12-13)	(14-15)	(16-18)
	☐	21 ☐ Male 22 ☐ Female	☐	☐
	☐	21 ☐ Male 22 ☐ Female	☐	☐
	☐	21 ☐ Male 22 ☐ Female	☐	☐
	☐	21 ☐ Male 22 ☐ Female	☐	☐
	☐	21 ☐ Male 22 ☐ Female	☐	☐
	☐	21 ☐ Male 22 ☐ Female	☐	☐
	☐	21 ☐ Male 22 ☐ Female	☐	☐
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	☐	21 ☐ Male 22 ☐ Female	☐	☐
	☐	21 ☐ Male 22 ☐	☐	☐
	☐	21 ☐ Male 22 ☐ Female	☐	☐
	☐	21 ☐ Male 22 ☐ Female	☐	☐
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	☐	21 ☐ Male 22 ☐ Female	☐	☐
	☐	21 ☐ Male 22 ☐ Female	☐	☐
	☐	21 ☐ Male 22 ☐ Female	☐	☐
	☐	21 ☐ Male 22 ☐ Female	☐	☐
	☐	21 ☐ Male 22 ☐ Female	☐	☐

ACCIDENT AND ILLNESS REPORT FORM
GENERAL

Form No. NSC-F2(Rev.)
1-2

Accident/Illness Report IDentification Number

3-4 County No. | 5-6 Interviewer No. | 7-8 Household No. | 9-10 Accident/Illness No.(CIRCLE Event)

Date of event(Fill-in)_____

Name of person involved:

(First name only) _____

Check bi-level report(s) used to complete this report:

11 ☐ F3 15 ☐ F7 19 ☐ F11
12 ☐ F4 16 ☐ F8 20 ☐ F12
13 ☐ F5 17 ☐ F9 21 ☐ F13
14 ☐ F6 18 ☐ F10 22 ☐ F14

Read instructions before filling out the form below.

1. Use a separate Report Form for each injury or each illness for each person
2. Fill-in your County No. and Interviewer No.. The Household No. is obtained from the Household IDentification List.
3. Assign the Accident or Illness number in the order that each is investigated.
4. The ID Number assigned to this report is to be used for identifying the bi-level accident or illness report form also, if they are required to complete the report investigation.

1. Injured or Ill person identity:

1-A. Resident Class

23,1 ☐ Husband
2 ☐ Wife
3 ☐ Son
4 ☐ Daughter
5 ☐ Other, specify_____
6 ☐ Employee(full-time)
7 ☐ Employee(part-time)
8 ☐ Visitor
9 ☐ Guest

1-B. Age

24-25 _____(Fill-in)years

2-C. Sex

26,1 ☐ Male
2 ☐ Female

2. If this is an accident report, check the number of persons injured in this accident(check one):

27,1 ☐ One
2 ☐ Two
3 ☐ Three
4 ☐ Four or more
5 ☐ Unknown

3. When injured or taken ill, individual was doing(check one):

28,1 ☐ Work
2 ☐ Leisure(not work related)
3 ☐ Unknown

4. Time of Accident or Illness:

4-A. Month event occurred:

29-30,01 ☐ Jan.
02 ☐ Feb.
03 ☐ Mar.
04 ☐ April
05 ☐ May
06 ☐ June
07 ☐ July
08 ☐ Aug.
09 ☐ Sept.
10 ☐ Oct.
11 ☐ Nov.
12 ☐ Dec.
13 ☐ Unknown

4-B. Day accident or illness occurred:

31,1 ☐ Sunday
2 ☐ Monday
3 ☐ Tuesday
4 ☐ Wednesday
5 ☐ Thursday
6 ☐ Friday
7 ☐ Saturday
8 ☐ Unknown

4-C. Time(Check nearest time):

	A.M.	P.M.	A.M.	P.M.
32-33,01	☐ 1:00	13 ☐	07 ☐ 7:00	19 ☐
02	☐ 2:00	14 ☐	08 ☐ 8:00	20 ☐
03	☐ 3:00	15 ☐	09 ☐ 9:00	21 ☐
04	☐ 4:00	16 ☐	10 ☐ 10:00	22 ☐
05	☐ 5:00	17 ☐	11 ☐ 11:00	23 ☐
06	☐ 6:00	18 ☐	12 ☐ 12:00	24 ☐

25 ☐ Unknown

DATE EDITED_____
(Office use)

5. Was the Person:

34,1 ☐ Injured
2 ☐ Ill(If ill, complete NSC-F10, also)

6. If injured, how serious?(Check one)*

35,1 ☐ Slight(no medical treatment except bandage, antiseptic, etc.)
2 ☐ Severe(broken bones, cuts requiring treatment, sprained back, etc.)
3 ☐ Permanent(any loss of full use of part of body--amputation, etc.)
4 ☐ Fatal
5 ☐ Unknown

*Complete Supplemental Medical & Cost(F3) Data Form when information is available.

7. What was activity of victim when accident/illness occurred?

7-A. Type(Check one):

36,1 ☐ Building maintenance & repair
2 ☐ Field work
3 ☐ Housework
4 ☐ Machinery maintenance & repair
5 ☐ Recreation
6 ☐ Routine chores
7 ☐ Treating livestock
8 ☐ Yard work
9 ☐ Other, specify_____

7-B. Action(Check one, if applicable):

37-38,01 ☐ Climbing
02 ☐ Driving
03 ☐ Jumping
04 ☐ Kneeling
05 ☐ Lifting
06 ☐ Lying down
07 ☐ Riding
08 ☐ Running
09 ☐ Sitting
10 ☐ Standing
11 ☐ Walking
12 ☐ Other,_____

8. Who administered first aid?

39,1 ☐ Doctor
2 ☐ Family member
3 ☐ Nurse
4 ☐ Self-treatment
5 ☐ More than one, specify_____
6 ☐ Other, specify_____

9. Professional treatment by doctor:

40,1 ☐ Not required
2 ☐ One time
3 ☐ Two or more times

10. Type of injury(Check one):
(NOTE: If illness report, skip to Q. 11.)

41-42,01 ☐ Amputation
02 ☐ Asphyxiation
03 ☐ Bruise
04 ☐ Burn
05 ☐ Cracked, fractured or broken bones
06 ☐ Cut or laceration
07 ☐ Eye injury
08 ☐ Mangled
09 ☐ Pinched
10 ☐ Puncture
11 ☐ Sprain
12 ☐ Multiple, specify_____
13 ☐ Other, specify_____

11. What part of the body was involved?

43-44,01 ☐ Arm
02 ☐ Back
03 ☐ Chest
04 ☐ Eye
05 ☐ Finger
06 ☐ Foot
07 ☐ Genital
08 ☐ Hand
09 ☐ Head
10 ☐ Leg
11 ☐ Neck
12 ☐ Shoulder
13 ☐ Toe
14 ☐ Trunk
15 ☐ Multiple, specify_____
16 ☐ Other, specify_____

DATE EDITED_____
(Office use)

12. How did injury or illness occur?(Check response closely describing event):

46,01 ☐ Caught part of body in object
02 ☐ Caught part of body between objects
03 ☐ Caught part of body under object
04 ☐ Struck against or by object, etc.
05 ☐ Struck by falling object or material
06 ☐ Struck by flying object or material
07 ☐ Contact with sharp object(knife, etc.)
08 ☐ Foreign object or material struck or lodged in victim
09 ☐ Fall, same level*
10 ☐ Fall, different level*
11 ☐ Fall, unknown
12 ☐ Contact with electrical current
13 ☐ Contact with fire or hot object
14 ☐ Contact with hot substance(steam, etc.)
15 ☐ Contact with corrosive or toxic item
16 ☐ Contact with other harmful liquid (fuel, paint, etc.)
17 ☐ Overexertion(strain exhaustion)
18 ☐ Inhaling gas or vapor
19 ☐ Exposure to or reaction from material
20 ☐ Other, specify_____

*If this is a factor and Item 7-B. involved running, walking or climbing, complete Supplemental Form NSC-F9.

13. Where was person treated?

47,1 ☐ Clinic
2 ☐ Doctor's office
3 ☐ Home
4 ☐ Hospital, admitted
5 ☐ Hospital, emergency
6 ☐ No treatment
7 ☐ More than one place, specify_____

_____

14. Scene of accident or illness:

14-A. Weather conditions(time of event)

1. Temperature

48,1 ☐ 0° or below
2 ☐ 1° to 32°
3 ☐ 33° to 50°
4 ☐ 51° to 85°
5 ☐ 86° to 100°
6 ☐ Over 100°

2. Precipitation

49,1 ☐ Clear
2 ☐ Fog
3 ☐ Ice
4 ☐ Rain
5 ☐ Snow
6 ☐ Threatening
7 ☐ Other, specify_____

3. Wind

50,1 ☐ Calm
2 ☐ Light breeze
3 ☐ 10 to 25 mph
4 ☐ 26 to 40 mph
5 ☐ Over 40 mph

14-B. General location:

51-52,01 ☐ Barn
02 ☐ Barnyard
03 ☐ Driveway
04 ☐ Front/back yard/garden
05 ☐ Farm building, other(not house)
06 ☐ Field(cropland)
07 ☐ Highway, state or federal
08 ☐ House
09 ☐ Land(pasture, range, woods)
10 ☐ Lagoon, manure pit
11 ☐ Pond, pool, stream, river
12 ☐ Public place
13 ☐ Road, county or township
14 ☐ Other, specify_____

14-C. Surface condition:

53,1 ☐ Dry
2 ☐ Icy
3 ☐ Muddy
4 ☐ Straw, hay, sawdust, etc. covered
5 ☐ Other, specify_____
6 ☐ Oily or greasy
7 ☐ Snow covered
8 ☐ Wet

DATE EDITED_____
(Office use)

14. Scene of accident or illness(con't.)

14-D. Surface type;

54,1 ☐ Asphalt
2 ☐ Brick
3 ☐ Concrete
4 ☐ Floor covering(carpet, vinyl, etc.)
5 ☐ Metal
6 ☐ Soil(clay, sand, etc.)
7 ☐ Vegetation
8 ☐ Wood
9 ☐ Other, specify_____

14-E. Light conditions:

55,1 ☐ Artificial light, good
2 ☐ Artificial light, poor
3 ☐ Daylight
4 ☐ Dark
5 ☐ Dawn or dusk
6 ☐ Reduced due to dust, smoke or fog

14-F. Thing involved(check one):

56-57,0 ☐ Agricultural machinery* (F5) (except tractors)
02 ☐ Animal* (F6)
03 ☐ Another person
04 ☐ Chemical* (F7)
05 ☐ Electrical power
06 ☐ Firearms
07 ☐ Gas or vapor
08 ☐ Hand tool* (F8)
09 ☐ Household items
10 ☐ Power tool* (F8)
11 ☐ Sports
12 ☐ Tractor* (F4)
13 ☐ Truck* (F14)
14 ☐ Auto, Bus, other vehicle
15 ☐ None
16 ☐ Powered lawn &/or garden equipment*(F12) Also Snowmobile or other recreational equipment.

*If item with * is checked, complete appropriate Supplemental Form.

14. Scene of accident or illness(con't.):

14-G. Approximate time victim was with "Thing involved" on day of accident or illness prior to event:

58,1 ☐ One hour or less
2 ☐ 2 to 4 hours
3 ☐ 5 to 8 hours
4 ☐ Over 8 hours

14-H. Estimate experience with the "Thing involved":

59-61 _____(Fill-in approx. no. days)

15. General Information:

15-A. Major type of agricultural operation:

62-63,01 ☐ Beef
02 ☐ Corn
03 ☐ Cotton
04 ☐ Grain
05 ☐ Rice
06 ☐ Soybeans
07 ☐ Sugar cane
08 ☐ Tobacco
09 ☐ Beef & hogs
10 ☐ Fruit
11 ☐ Truck crops
12 ☐ Dairy
13 ☐ Seed Crops
14 ☐ Other, specify_____
15 ☐ Hogs
16 ☐ Poultry
17 ☐ Corn & Beef
18 ☐ Corn & Hogs
19 ☐ Co & Soybeans
20 ☐ & Hogs
21 ☐ Sheep
22 ☐ Nuts
23 ☐ Cut flowers
24 ☐ Field flowers
25 ☐ Nursery
26 ☐ Container Plants
27 ☐ Field Crops

15-B. Acreage in agricultural operation:

64-69 _____(Fill-in actual acreage)

15-C. Do you produce $1,000 or more of agricultural products annually?

70,1 ☐ Yes 2 ☐ No

16. Additional information concerning the accident or the cause of the illness will be helpful--how event happened, victim's action or movement, thing involved, etc.
Check here ☐ if you supply information on another sheet.

DATE EDITED_____
(Office use)

AGRICULTURAL WORK ACCIDENT REPORT FORM

Form No. NSC-F2
Rev. 79-2

INSTRUCTIONS: Use a separate sheet for each person injured. Use this Accident Report IDentification Number on all forms pertaining to this accident. It is very important that the County, Interviewer, and Household numbers are entered correctly so that this report can be matched with the Master Data Sheet for this farm.

Accident Report IDentification Number:

Form: F2 (1-2)

1. Fill in your County number . . . . . County:_____(3-4)

2. Fill in your Interviewer number . . . . . Interviewer:_____(5-6)

3. Enter the Household number for this farm from your Household IDentification List . . . . . Houschold:_____(7-8)

4. Assign the accident number in the order that each is reported for this farm . . . . . Accident:_____(9-10)

5. Use a different person number for each person injured in this accident. First name of injured:_____, Person:_____(11-12)

Describe briefly how the accident happened including what the person was doing, what specific objects or substances were involved, and the action or movement which led to the injury. Example: "While doing maintenance on tractor, hand slipped off wrench and severely cut fingers on sharp sheet metal."

Indicate which bi-level reports will be used to complete this investigation: F4 F5 F6 Other:_____.

1. Resident class of the victim: (13-14)

- 01 ☐ Husband
- 02 ☐ Wife
- 03 ☐ Son
- 04 ☐ Daughter
- 05 ☐ Other family member
- 06 ☐ Full-time employee
- 07 ☐ Part-time employee
- 08 ☐ Other worker (vet, contractor, etc.)
- 09 ☐ Visitor or guest
- 10 ☐ Unknown

2. Age of the victim (in years):_____ (15-16)

3. Sex of the victim: (17-18)

- 01 ☐ Male
- 02 ☐ Female

4. Month in which the accident occurred: (19-20)

- 01 ☐ January
- 02 ☐ February
- 03 ☐ March
- 04 ☐ April
- 05 ☐ May
- 06 ☐ June
- 07 ☐ July
- 08 ☐ August
- 09 ☐ September
- 10 ☐ October
- 11 ☐ November
- 12 ☐ December

5. Seriousness of the injury: (21-22)

- 01 ☐ Slight—no medical treatment except bandage, antiseptic, etc.
- 02 ☐ Severe—broken bone, cut requiring treatment, sprained back, etc.
- 03 ☐ Permanent—any loss of full use of any body part, amputation, etc.
- 04 ☐ Fatal

6. Type of injury (most serious if more than one injury was suffered): (23-24)

- 01 ☐ Amputation
- 02 ☐ Asphyxiation (including drowning)
- 03 ☐ Bruise
- 04 ☐ Burn
- 05 ☐ Cut or laceration
- 06 ☐ Crushing
- 07 ☐ Electric shock
- 08 ☐ Eye injury
- 09 ☐ Fracture
- 10 ☐ Mangled
- 11 ☐ Punctured
- 12 ☐ Sprained or strained
- 13 ☐ Other _____
- 14 ☐ Unknown

7. Part of body injured (most seriously if more than one part was injured):

(25-26)
- 01 ☐ Arm
- 02 ☐ Back
- 03 ☐ Chest
- 04 ☐ Eye
- 05 ☐ Finger
- 06 ☐ Foot, including ankle
- 07 ☐ Genitals
- 08 ☐ Hand, including wrist
- 09 ☐ Head, except eye
- 10 ☐ Leg
- 11 ☐ Neck
- 12 ☐ Shoulder
- 13 ☐ Toe
- 14 ☐ Trunk
- 15 ☐ Other _____ _____
- 16 ☐ Unknown

8. General location where the accident occurred:

(27-28)
- 01 ☐ Barn
- 02 ☐ Barnyard
- 03 ☐ Driveway
- 04 ☐ Farm building (except barn)
- 05 ☐ Field or cropland
- 06 ☐ Highway, state or federal
- 07 ☐ Road, county or township
- 08 ☐ Land, pasture, range or woods
- 09 ☐ Lagoon or manure pit
- 10 ☐ Pond, stream or river
- 11 ☐ Public place
- 12 ☐ Other location off the farm_____
- 13 ☐ Other location on the farm_____
- 14 ☐ Unknown

9. Type of work being performed at the time of the accident:

(29-30)
- 01 ☐ Farm building maintenance or repair
- 02 ☐ Field work
- 03 ☐ Machinery maintenance, service, or repair
- 04 ☐ Routine chores
- 05 ☐ Livestock treatment or handling
- 06 ☐ Operating or riding a tractor, farm machine, or other vehicle
- 07 ☐ Other activity_ _____
- 08 ☐ Unknown

10. Bodily motion of victim at time of accident:

(31-32)
- 01 ☐ Climbing
- 02 ☐ Jumping
- 03 ☐ Kneeling
- 04 ☐ Lifting
- 05 ☐ Lying down
- 06 ☐ Reaching, stretching
- 07 ☐ Running
- 08 ☐ Sitting
- 09 ☐ Standing
- 10 ☐ Walking
- 11 ☐ Other_____
- 12 ☐ Unknown

11. How the injury occurred:

(33-34)
- 01 ☐ Caught part of body <u>in</u> object
- 02 ☐ Caught part of body <u>between</u> objects
- 03 ☐ Caught part of body <u>under</u> object
- 04 ☐ Struck by or against object
- 05 ☐ Struck by falling object or material
- 06 ☐ Struck by flying object or material
- 07 ☐ Contact with sharp object (knife, nail, etc.)
- 08 ☐ Foreign object or material struck or lodged in body
- 09 ☐ Fall on same level
- 10 ☐ Fall from one level to another
- 11 ☐ Fall, unknown type
- 12 ☐ Contact with electric current
- 13 ☐ Contact with fire or hot object
- 14 ☐ Contact with hot substance (steam, etc.)
- 15 ☐ Contact with corrosive or toxic item
- 16 ☐ Contact with other harmful liquid
- 17 ☐ Overexertion
- 18 ☐ Inhalation of gas or vapor
- 19 ☐ Exposure to or reaction from material
- 20 ☐ Moving motor-vehicle accident
- 21 ☐ Other_____
- 22 ☐ Unknown

12-13. Agency of accident and injury.

<u>Agency of accident</u> is the object or substance that was involved in the sequence of events that <u>led to</u> the injury.

<u>Agency of injury</u> is the object or substance that actually <u>inflicted</u> the injury.

<u>Examples</u>: (1) A farmer slips while getting off his tractor and strains his back when he strikes the ground. Check "Tractor" under Accident and "Floor or ground" under Injury. (2) A farmer's foot is broken when an animal steps on it. Check "Animal" under both Accident and Injury.

<u>Accident</u> (35-36)	<u>Injury</u> (37-38)		
☐	01 ☐	Agricultural machinery *(complete bi-level form F5)*
☐	02 ☐	Animal *(complete bi-level form F6)*
☐	03 ☐	Another person
☐	04 ☐	Chemical (solid, liquid, or gas)
☐	05 ☐	Electric current
☐	06 ☐	Firearm
☐	07 ☐	Hand tool
☐	08 ☐	Power tool
☐	09 ☐	Ladder
☐	10 ☐	Tractor *(complete bi-level form F4)*
☐	11 ☐	Truck (including 4-wheel drive vehicles)
☐	12 ☐	Other vehicle (auto, motorcycle, bike, etc.)
☐	13 ☐	Floor or ground
☐	14 ☐	Stairway or steps
☐	15 ☐	Walls, doors, fences, gates
☐	16 ☐	None
☐	17 ☐	Other _____
☐	99 ☐	Unknown

14. If a vehicle or piece of powered equipment was involved, the victim was:

(39-40)
- 01 ☐ The driver or operator
- 02 ☐ A passenger or assisting the operator
- 03 ☐ A nonoccupant or bystander
- 04 ☐ Unknown

SUPPLEMENTAL

ACCIDENT AND ILLNESS REPORT FORM

Form No. NSC-F3(Rev.)

1-2

MEDICAL AND COST INFORMATION

Accident/Illness Report IDentification Number

3-4 County No. 5-6 Interviewer No. 7-8 Household No. 9-10 Accident/Illness No. (CIRCLE Event)

Read instructions before filling out the form below.

1. Use Report ID Number from the General Accident and Illness Report(NSC-F2-Rev.)
2. Completed form to be attached to Accident and Illness report referred to above.

1. Health status of person involved (before injury or illness):

11,1 ☐ Good
2 ☐ Under doctor's care
3 ☐ Taking medication
4 ☐ Ill on day of accident*
5 ☐ Mentally handicapped
6 ☐ Physically handicapped
7 ☐ Other, specify_____
8 ☐ Unknown

*If a factor, complete Illness Report Form No. NSC-F10, also.

2. Total days lost from usual activities:

12-14 _____(Fill-in actual number) Days

3. Days in hospital due to injury or illness:

15-17 _____(Fill-in actual number) Days

4. Medical expense(doctor, medicine, hospital, etc., including that paid by insurance)incurred as a result of this injury or illness:

18-22 $_____(Fill-in actual amount of expenses)Dollars

5. Total property damage(all parties involved)--injuries only:

23-27 $_____(Fill-in actual amount of damage)Dollar

6. Number of days hired help was used to replace injured or ill person:

28-30 _____(Fill-in actual number)Days

7. Cost of replacement labor:

31-35 $_____(Fill-in actual cost)Dollars

8. What was the health status of victim following recovery from injury or illness?

36,1 ☐ Good
2 ☐ Mentally handicapped
3 ☐ Physically handicapped
4 ☐ Other, specify_____

9. If handicapped, were rehabilitation services necessary before returning to gainful employment?

37,1 ☐ Yes
2 ☐ No
3 ☐ Unknown

10. If victim suffered loss of full use of part of the body, did they return to farming?

38,1 ☐ Yes
2 ☐ No, to other occupation
3 ☐ No, unable to work
4 ☐ Unknown

DATE EDITED_____
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SUPPLEMENTAL
ACCIDENT REPORT FORM

Form No. NSC-F4(Rev.)
1-2

AGRICULTURAL TRACTORS

ACCIDENT REPORT IDENTIFICATION NUMBER

3-4 County No. _____ 5-6 Interviewer No. _____ 7-8 Household No. _____ 9-10 Accident No. _____

Tractor Identification:

Make: _____ Model: _____

Fuel type:

11,1 ☐ Gas 2 ☐ Diesel 3 ☐ LP

Read instructions before filling out the form below.

1. Use Accident Report ID Number from the General Accident Report(Form No. NSC-F2) previously completed for this injury.
2. This form, when completed, will be attached to the report referred to above.

1. Type or tractor involved in accident:

12,1 ☐ Tricycle
2 ☐ Wide front axle, adj.
3 ☐ Wide front axle, std.
4 ☐ Hi-crop
5 ☐ Crawler
6 ☐ 4-wheel-drive, articulated

2. Approximate age of tractor:

13,1 ☐ One year or less
2 ☐ 2 to 5 years
3 ☐ 6 to 10 years
4 ☐ Over 10 years

3. Was tractor a standard production model at time of accident?

14,1 ☐ Yes
2 ☐ No
3 ☐ Unknown

4. Indicate type of accident:

15-16,01 ☐ Collision, from the side
02 ☐ Collision, head-on
03 ☐ Collision, rear
04 ☐ Equipment failure
05 ☐ Fall
06 ☐ Fire
07 ☐ Overturn, backward
08 ☐ Overturn, sideways
09 ☐ PTO
10 ☐ Unknown
11 ☐ Other, specify _____

5. Wheel spacing at time of accident:

17,1 ☐ Narrow
2 ☐ Normal or mid-setting
3 ☐ Wide or extended

6. Tractor use at time of accident:
(Note: If other machinery involved, complete items 1 through 4 of Form NSC-F5, also.)

18-19,01 ☐ Freeing mired equipment
02 ☐ Harvesting, tillage
03 ☐ Herding cattle
04 ☐ Loading, unloading
05 ☐ Parked
06 ☐ Planting, sowing
07 ☐ Runaway or coasting(w/out driver)
08 ☐ Stationary(belt or PTO operating)
09 ☐ Stuck
10 ☐ Traveling to or from field
11 ☐ Other, specify _____
12 ☐ Unknown

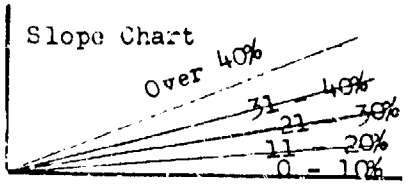
7. If tractor over-turn, indicate degrees roll:

20,1 ☐ 90° 4 ☐ 360°
2 ☐ 180° 5 ☐ Over 360°
3 ☐ 270°

8. Slope of surface at accident(Check only one):

21,1 ☐ 0 to 10%
2 ☐ 11 to 20%
3 ☐ 21 to 30%
4 ☐ 31 to 40%
5 ☐ Over 40%

Slope Chart



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9. Check the condition that was the initial cause of the accident event:

22-23,01 ☐ Crossing slope
02 ☐ Damaged PTO guard or shield
03 ☐ Faulty brakes
04 ☐ Going down hill
05 ☐ Going up the hill
06 ☐ Guard not provided
07 ☐ Guard removed
08 ☐ Hidden object--struck it
09 ☐ Hitched to axle
10 ☐ Struck hole or rough ground
11 ☐ Slipped into open ditch
12 ☐ Slippery surface
13 ☐ Other, specify _____
14 ☐ Unknown

10. Identify the act permitting the accidental injury:

24-25,01 ☐ Disobeyed traffic rules
02 ☐ Driving too fast for conditions
03 ☐ Failed to disengage PTO .
04 ☐ Failed to shut-off tractor engine before dismounting
05 ☐ Failed to lock brakes or transmission before dismounting
06 ☐ Failed to use protective equipment
07 ☐ Failed to engage clutch slowly
08 ☐ Failed to wear safe personal attire
09 ☐ Horseplay
10 ☐ Jumped
11 ☐ Lack of front or rear weights
12 ☐ Moving tractor w/loader bucket high
13 ☐ Permitted extra rider
14 ☐ Permitted hitching to other than
15 ☐ Reaching(over, under, into)
16 ☐ Smoking while refueling
17 ☐ Turning at high speed
18 ☐ Overloading
19 ☐ Other, specify _____
20 ☐ Unknown

11. Specific scene of accident:

26-27,01 ☐ Barn
02 ☐ Bridge
03 ☐ Cattle shed
04 ☐ Corn or cotton field
05 ☐ Driveway, lane
06 ☐ Feedlot
07 ☐ Grain field
08 ☐ Hay field
09 ☐ Highway
10 ☐ Pasture
11 ☐ Shop or machine shed
12 ☐ Woods
13 ☐ Other, specify _____
14 ☐ Unknown

12. Check each component on tractor at time of accident:

28 ☐ Cab
29 ☐ Cab w/overturn protection & seat belt
30 ☐ Dual wheels
31 ☐ Fenders
32 ☐ Flashing light(s)
33 ☐ Front-end weights
34 ☐ Front wheel drive
35 ☐ Front wheel weights
36 ☐ Head lights
37 ☐ Hydraulic brakes
38 ☐ Power steering
39 ☐ PTO shield
40 ☐ Protective frame w/seat belt
41 ☐ Reflectors
42 ☐ Rearview mirror(s)
43 ☐ Rear wheel weights
44 ☐ Safety starting switch
45 ☐ SMV emblem
46 ☐ Tail light(s)
47 ☐ Tires filled w/liquid
48 ☐ Weather shield

13. Seat belt in use at time of accident:

49,1 ☐ Yes 2 ☐ No

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SUPPLEMENTAL

ACCIDENT REPORT FORM

Form No. NSC-F5(Rev.)

1 – 2

FARM MACHINERY

ACCIDENT REPORT IDENTIFICATION NUMBER

3 – 4 County No. | 5 – 6 Interviewer No. | 7 – 8 Household No. | 9 – 10 Accident No.

Machine Identification:

Make _____

Model _____

Read instructions before filling out the form below.

1. Use Accident Report ID Number from the General Accident Report (Form No. NSC-F2) previously completed for this injury.
2. This form, when completed will be attached to the report referred to above.

1. Check type of farm machinery involved in accident:

11,1 ☐ Chemical, Fertilizer
2 ☐ Grain & Feed Handling
3 ☐ Haying Tools
4 ☐ Harvesting Equipment
5 ☐ Manure Handling
6 ☐ Seed planting
7 ☐ Tillage tools
8 ☐ Miscellaneous, specify_____
9 ☐ Unknown

2. Check the farm machine that was involved in the accident:

2-A. Chemical, Fertilizer

12,1 ☐ Duster
2 ☐ Distributor, spreader
3 ☐ Sprayer
4 ☐ Airplane
5 ☐ Other, specify_____

2-B. Grain, Feed & Fruit Handling

13 – 14,01 ☐ Blower--forage, grain
02 ☐ Bunk feeder
03 ☐ Conveyor, auger
04 ☐ Conveyor, belt
05 ☐ Conveyor, chain
06 ☐ Corn sheller
07 ☐ Dryer, grain
08 ☐ Elevator, auger
09 ☐ Elevator, chain
10 ☐ Feed grinder
11 ☐ Feed grinder-mixer

2-B Grain, etc. Handling (con't.)

13 – 14,12 ☐ Feed Mixer/blender
13 ☐ Silo unloader
14 ☐ Other, specify_____

2-C. Haying Tools

15 – 16,01 ☐ Baler, hay
02 ☐ Forage harvester
03 ☐ Hay conditioner
04 ☐ Mower, sickle bar
05 ☐ Mower, sickle bar w/conditioner
06 ☐ Mower, rotary
07 ☐ Rake, hay
08 ☐ Hay cuber
09 ☐ Windrower
10 ☐ Other, specify_____
11 ☐ Round baler, hay

2-D. Harvesting Equipment

17 – 18,01 ☐ Combine w/corn head
02 ☐ Combine w/grain head
03 ☐ Corn picker
04 ☐ Corn picker-sheller
05 ☐ Cotton picker
06 ☐ Cotton stripper
07 ☐ Sugarbeet harvester
08 ☐ Fruit harvester
09 ☐ Vegetable harvester
10 ☐ Threshing machine
11 ☐ Other, specify_____

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2-E. Manure Handling

19,1 ☐ Barn cleaner
2 ☐ Gutter cleaner
3 ☐ Liquid manure pump
4 ☐ Manure loader, tractor
5 ☐ Manure spreader
6 ☐ Manure spreader, tank
7 ☐ Other, specify_____

2-F. Seed Planting

20,1 ☐ Broadcaster
2 ☐ Grain drill
3 ☐ Planter--cotton, corn, etc.
4 ☐ Other, specify_____

2-G. Tillage Tools

21,1 ☐ Cultivator
2 ☐ Disc harrow
3 ☐ Plow, disc
4 ☐ Plow, moldboard
5 ☐ Rotary tiller
6 ☐ Other, specify_____
7 ☐ Plow, chisel
8 ☐ Spring tooth harrow

2-H. Miscellaneous Equipment

22-23,01 ☐ Engine, power unit
02 ☐ Implement carrier
03 ☐ Irrigation equipment
04 ☐ Ladders
05 ☐ Skiploaders
06 ☐ Forklifts
07 ☐ Truck
08 ☐ Pruning equipment
09 ☐ Pump jack
10 ☐ Stalk shredder
11 ☐ Wagon(w/grain box) *
12 ☐ Wagon(w/flat bed) *
13 ☐ Wagon, self-unloading*
14 ☐ Other, specify_____

*If item with * is checked, complete Supplemental Form, NSC-F11, also.

2-I. Animal Handling Equipment

24,1 ☐ Squeeze Chutes
2 ☐ Branding
3 ☐ Shears
4 ☐ Other, specify_____

3. Approximate age of machine:

25,1 ☐ One year or less
2 ☐ 2 to 5 years
3 ☐ 6 to 10 years
4 ☐ Over 10 years
5 ☐ Unknown

4. Machine mounting or hitching:

26,1 ☐ Does not apply
2 ☐ Integral
3 ☐ Mounted, front
4 ☐ Mounted, rear
5 ☐ Self-propelled
6 ☐ Semi-mounted
7 ☐ Towed
8 ☐ Other, specify_____

5. Use of machine at time of accident:

27,1 ☐ Harvesting
2 ☐ In-transit
3 ☐ Loading
4 ☐ Planting
5 ☐ Spreading
6 ☐ Stopped, not running
7 ☐ Stopped, but running
8 ☐ Tillage
9 ☐ Other, specify_____

6. Equipment powered by(Check one):

28,1 ☐ Does not apply
2 ☐ Electric motor
3 ☐ Engine, gas, diesel, LP
4 ☐ Ground drive
5 ☐ Hand
6 ☐ Hydraulic
7 ☐ PTO
8 ☐ Other, specify_____

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7. Portion of machine causing injury:

29-30,01 ☐ Auger
02 ☐ Bale ejector
03 ☐ Cable or linkage
04 ☐ Chain & sproket
05 ☐ Control devices(pedals, levers, etc)
06 ☐ Cutterhead
07 ☐ Feeding mechanism
08 ☐ Gears
09 ☐ Hammers
10 ☐ Hitch or drawbar
11 ☐ Hydraulic fluid
12 ☐ Hydraulic hose
13 ☐ Knife blade
14 ☐ Knotter mechanism
15 ☐ Lifting mechanism
16 ☐ PTO shaft and/or knuckles
17 ☐ Plungerhead
18 ☐ Rolls, snapping, husking, crusher
19 ☐ Rotating shaft, except PTO
20 ☐ Spindles
21 ☐ Tire or wheel
22 ☐ V-belt & Pulley
23 ☐ Other, specify_____
24 ☐ None

8. Condition at time of accident:

31-32,01 ☐ Damaged guard
02 ☐ Equipment failure
03 ☐ Good condition
04 ☐ Grease, oil present
05 ☐ Guard not provided
06 ☐ Guard removed
07 ☐ Improper hitch
08 ☐ Leaking or spilled fuel
09 ☐ No brakes
10 ☐ Poor brakes
11 ☐ Other, specify_____

9. Safety features in place at time of accident:

33 ☐ Flag
34 ☐ Lights
35 ☐ SMV emblem
36 ☐ Reflectors
37 ☐ Other, specify_____

10. Activity of injured person prior to accident:

38-39,01 ☐ Adjusting
02 ☐ Bystander
03 ☐ Cleaning
04 ☐ Feeding material
05 ☐ Filling seed boxes, etc.
06 ☐ Lubricating
07 ☐ Operating
08 ☐ Refueling
09 ☐ Repairing, installing equip.
10 ☐ Riding
11 ☐ Other, specify_____
12 ☐ Hitching-up
13 ☐ Unknown

11. Act permitting the accidental injury:

40-41,01 ☐ Distracted
02 ☐ Failure to use protective equipment (guards, shields)
03 ☐ Horseplay
04 ☐ Improper use of equipment
05 ☐ Inattentive
06 ☐ Jumped
07 ☐ Lost balance
08 ☐ Permitted extra rider(s)
09 ☐ Reaching(over, under, into)
10 ☐ Too fast for conditions
11 ☐ Unsafe position or posture
12 ☐ Other, specify_____
_____
13 ☐ Unknown

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12. Specific scene of accident:

42-43 01 ☐ Barn
02 ☐ Bridge
03 ☐ Cattle shed
04 ☐ Corn or cotton field
05 ☐ Driveway, lane
06 ☐ Feedlot
07 ☐ Grain field
08 ☐ Granary or feed storage
09 ☐ Greenhouse
10 ☐ Hay field
11 ☐ Hog house
12 ☐ Highway
13 ☐ Machine shed
14 ☐ Orchard
15 ☐ Pasture
16 ☐ Poultry house
17 ☐ Shop
18 ☐ Silo
19 ☐ Woods
20 ☐ Other, specify_____
21 ☐ Unknown

DATE EDITED _____
(Office use)

SUPPLEMENTAL

ACCIDENT REPORT FORM

Form No. NSC-F6(Rev.)

1 - 2

ANIMALS

3 - 4 County No. | 5 - 6 Interviewer No. | 7 - 8 Household No. | 9 - 10 Accident No.

Read instructions before filling out the form below.

1. Use Accident Report ID Number from the General Accident Report (Form No. NSC-F2) previously completed for this injury.
2. This form, when completed, will be attached to the report referred to above.

1. Animal involved in accident:

11 - 12,01 ☐ Boar
02 ☐ Bull
03 ☐ Calf
04 ☐ Cat
05 ☐ Chicken
06 ☐ Colt
07 ☐ Cow
08 ☐ Dog
09 ☐ Gelding
10 ☐ Gilt
11 ☐ Goose
12 ☐ Mare
13 ☐ Ram
14 ☐ Sheep
15 ☐ Shoat
16 ☐ Sow
17 ☐ Stallion
18 ☐ Steer
19 ☐ Turkey
20 ☐ Other, specify _____

2. Activity of victim prior to accident:

13 - 14,01 ☐ Administering medication
02 ☐ Assisting with delivery
03 ☐ Branding
04 ☐ Bridling
05 ☐ Brushing
06 ☐ Castrating
07 ☐ Chasing
08 ☐ Cleaning
09 ☐ Dismounting
10 ☐ Feeding
11 ☐ Haltering
12 ☐ Harnessing
13 ☐ Leading
14 ☐ Other, specify _____
15 ☐ Milking
16 ☐ Passing by
17 ☐ Petting
18 ☐ Riding
19 ☐ Saddling
20 ☐ Teasing
21 ☐ Shearing
22 ☐ Breaking
23 ☐ Breeding

3. Act by victim permitting the injury:

15 - 16,01 ☐ Approached from the rear
02 ☐ Entered animal enclosure
03 ☐ Horseplay (showing-off)
04 ☐ Improper use
05 ☐ Jumped
06 ☐ Lost balance
07 ☐ Made quick movement
08 ☐ Unaware of animal presence
09 ☐ Loss of temper
10 ☐ Other, specify _____

4. Part of animal causing injury:

17 - 18,01 ☐ Body
02 ☐ Foot
03 ☐ Front hoofs
04 ☐ Head
05 ☐ Horn
06 ☐ Mouth, beak
07 ☐ Rear hoofs
08 ☐ Tail
09 ☐ Wing
10 ☐ Other, specify _____

5. Conditions at time of accident:

19,1 ☐ Slippery, unstable surface
2 ☐ Animal w/offspring
3 ☐ Unexpected or excess noise
4 ☐ Hole
5 ☐ Handler, fatigued
6 ☐ Other animal
7 ☐ Irritated by insects or burrs
8 ☐ Other, specify _____

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6. Was animal secured properly:

20,1 ☐ Yes
2 ☐ No
3 ☐ Not secured
4 ☐ Unknown

7. If secured, how was it done?

21-22,01 ☐ Bridle
02 ☐ Cage, Pen
03 ☐ Caught in fence, etc.
04 ☐ Collar & rope or chain
05 ☐ Halter & rope or chain
06 ☐ Rope around neck
07 ☐ Rope around leg
08 ☐ Stanchion
09 ☐ Squeeze chute
10 ☐ Other, specify_____

8. What was activity of animal prior to accident?

23-24,01 ☐ Bucking
02 ☐ Eating
03 ☐ Jumping
04 ☐ Lying down
05 ☐ Rearing
06 ☐ Running
07 ☐ Standing
08 ☐ Walking
09 ☐ Protecting young
10 ☐ Other, specify_____

9. Specific scene of accident:

25-26,01 ☐ Arena
02 ☐ Barn
03 ☐ Bridge
04 ☐ Ditch
05 ☐ Feedlot
06 ☐ Hill
07 ☐ Milking parlor
08 ☐ Pasture
09 ☐ Pen
10 ☐ Paddock
11 ☐ Roadway
2 ☐ Shed
13 ☐ Stall
14 ☐ Stream
15 ☐ Woods
16 ☐ Squeeze chute
17 ☐ Other, specify_____

DATE EDITED_____
(Office use)

Form No. NSC-F7(Rev.)
1-72

SUPPLEMENTAL ACCIDENT REPORT FORM

CHEMICALS, AGRICULTURAL

ACCIDENT REPORT IDENTIFICATION NUMBER

3-4	5-6	7-8	9-10
County No.	Interviewer No.	Household No.	Accident No.

Read instructions before filling out the form below.

1. Use Accident Report ID Number from the General Accident Report (Form No. NSC-F2) previously completed for this injury.
2. This form, when completed, will be attached to the report referred to above.

1. Identify the chemical involved:

11-12, 01 ☐ 2,4D
02 ☐ 2,4,5T
03 ☐ Aldrin
04 ☐ Arsenicals
05 ☐ Anhydrous ammonia
06 ☐ Aquathol (endothall)
07 ☐ Avadex (Diallate)
08 ☐ Azodrin (monocrothophos)
09 ☐ Bladex (cyanazine)
10 ☐ Buctril, Brominal (bromoxynil)
11 ☐ Carbon bisulfide
12 ☐ Chlordane
13 ☐ Cygon or De-Fend (dimenthoalate)
14 ☐ DDT
15 ☐ Diazinon
16 ☐ Dibrom (naled)
17 ☐ Dieldrin
18 ☐ dinitro (dinoseb)
19 ☐ diquat
20 ☐ Ethion
21 ☐ Ethyl parathion
22 ☐ Fertilizer, specify content _____
23 ☐ Guthion (azinphosmethyl)
24 ☐ Magnacide II (acrolein)
25 ☐ Malathion
26 ☐ Mercury (organic compounds)
27 ☐ Methomyl (lannate)
28 ☐ Methyl Bromide
29 ☐ Methyl parathion
30 ☐ paraquat
31 ☐ Phosdrin (mevinphos)
32 ☐ Sevin (carbaryl)
33 ☐ Systox (dematon)
34 ☐ Tepp
35 ☐ Thimet (phorate)
36 ☐ Thiodan (endosulfan)
37 ☐ Toxaphene
38 ☐ Other, specify _____
39 ☐ Mixture of chemicals, specify _____

2. Are chemicals stored in a special building, room or cabinet?

13, 1 ☐ Yes
2 ☐ No
3 ☐ Unknown

3. If "Yes", is it locked?

14, 1 ☐ Yes
2 ☐ No
3 ☐ Unknown

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4. Activity of victim prior to accident:

15-16 01 ☐ Applying chemicals
02 ☐ Bystander
03 ☐ Disposing of chemicals
04 ☐ Disposing of container
05 ☐ Filling tank prior to application
06 ☐ Mixing chemicals
07 ☐ Not involved in work (child, etc., getting into chemicals)
08 ☐ Repairing chemical equipment
09 ☐ Transporting or handling chemicals
10 ☐ Working in areas that have been sprayed
11 ☐ Working in adjacent areas
12 ☐ Other, specify_____
13 ☐ Unknown
14 ☐ Seed treating

5. Hazardous condition involved:

17,1 ☐ Damaged safety equipment
2 ☐ Equipment failure(hose, valves, nozzles, etc.
3 ☐ Improper equipment for job
4 ☐ Improper storage/container
5 ☐ Leaking container
6 ☐ No safety equipment present
7 ☐ Other, specify_____
8 ☐ Dirty clothes/protective equip.
9 ☐ Unknown

6. Act permitting accidental injury:

18-19,01 ☐ Disregard of safety instructions
02 ☐ Failure to check equipment
03 ☐ Failure to instruct operator
04 ☐ Failure to use protective equip.
05 ☐ Horseplay
06 ☐ Inattentive
07 ☐ Improper cleaning procedures
08 ☐ Injured person unaware of hazard condition
09 ☐ Other, specify_____
10 ☐ Unknown

7. Fertilizer or chemical applied by:

20,1 ☐ Farm operator
2 ☐ Custom operator/ground
3 ☐ Custom operator/aerial
4 ☐ Dealer
5 ☐ Other, specify_____

8. Fertilizer or chemical contained:

21,1 ☐ No pest or weed control chemicals
2 ☐ Pest control chemicals only
3 ☐ Pest and weed control chemicals
4 ☐ Unknown
5 ☐ Other, specify_____
_____

9. Fertilizer or chemical was applied in:

22,1 ☐ Aerosols
2 ☐ Dry form
3 ☐ Gas
4 ☐ Granules
5 ☐ Liquid form
6 ☐ Other, specify_____
7 ☐ ULV (undiluted chemical, technical material)
8 ☐ Unknown
9 ☐ Mixture, specify_____
_____

10. Specific scene of accident:

23-24,01 ☐ Airport
02 ☐ Barn
03 ☐ Cattle shed
04 ☐ Chemical storage area
05 ☐ Corn field
06 ☐ Cotton field
07 ☐ Driveway
08 ☐ During transport
09 ☐ Feedlot
10 ☐ Grain field
11 ☐ Granary or feed storage

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10. Specific scene of accident(con't.):

23—24,12 ☐ Hay field
13 ☐ Hog house
14 ☐ Highway
15 ☐ Landing strip
16 ☐ Machine shed
17 ☐ Orchard
18 ☐ Packing shed
19 ☐ Pasture
20 ☐ Poultry house
21 ☐ Rice field
22 ☐ Seed crops field
23 ☐ Vacant lot
24 ☐ Woods
25 ☐ Other, specify _____
_____
26 ☐ Unknown

11. Acres treated during previous year for:

A. Control of insects and disease -- Approx. acreage _____ (25 — 29) acres.

B. Control of weeds and brush -- Approx. acreage _____ (30 — 34) acres.

C. Seed treatment -- Approx. quantity _____ (35 — 40) bushels.

12. Additional information concerning the accident may be described in the space below:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Date Edited _____
(Office use)

SUPPLEMENTAL ACCIDENT REPORT FORM

Form No. NSC-F8 (Rev.) 1-2

HAND AND POWER TOOLS

Accident Report IDentification Number

3-4	5-6	7-8	9-10
County No.	Interviewer No.	Household No.	Accident No.

Check type of tool involved:

11,1 ☐ Hand tool
2 ☐ Power tool
3 ☐ Power tool, portable

Read instructions before filling out the form below.

1. Use Accident Report ID Number from the General Accident Report Form NSC-F2 previously completed for this injury.
2. This form, when completed, will be attached to the report referred to above.

1. Injury was inflicted on:

12,1 ☐ Both sides of body
2 ☐ Left side of body
3 ☐ Right side of body
4 ☐ Other, specify _____

2. Injured person is normally:

13,1 ☐ Lefthanded
2 ☐ Righthanded
3 ☐ Unknown

3. Hand holding tool at time of injury:

14,1 ☐ Both
2 ☐ Left
3 ☐ Neither
4 ☐ Right
5 ☐ Unknown

4. If only one hand was involved indicate action of other hand:

15,1 ☐ Applying force
2 ☐ Hammering, etc.
3 ☐ Holding material
4 ☐ Idle
5 ☐ Supporting body
6 ☐ Other, specify _____
7 ☐ Unknown

5. Indicate position of tool at time of accident:

16,1 ☐ Above user(as if drilling through ceiling)
2 ☐ Below user(as if drilling through floor)
3 ☐ In front of user(as if drilling through wall)
4 ☐ Other, specify _____
5 ☐ Unknown

6. Tool was powered by:

17,1 ☐ Air
2 ☐ Battery
3 ☐ Electricity(line voltage)
4 ☐ Gasoline
5 ☐ Hand
6 ☐ Hydraulic
7 ☐ Other, specify _____
8 ☐ Unknown

7. Indicate event causing injury:

18-19,01 ☐ Caught or pinched
02 ☐ Electrical shock
03 ☐ Fell on tool
04 ☐ Hand slipped
05 ☐ Lost footing
06 ☐ Stepped on tool
07 ☐ Struck by flying particle
08 ☐ Tool was dropped or fell
09 ☐ Tool slipped
10 ☐ Other, specify _____
11 ☐ Unknown

8. Material being worked at time of injury:

20-21,01 ☐ Aluminum
02 ☐ Cast iron
03 ☐ Concrete
04 ☐ Plastic
05 ☐ Soil
06 ☐ Steel
07 ☐ Wire
08 ☐ Wood
09 ☐ Other, specify _____
10 ☐ Unknown

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9. Act permitting injury:

22-23,01 ☐ Holding tool improperly
02 ☐ Horseplay
03 ☐ Lost control
04 ☐ No ground used
05 ☐ Unsafe position
06 ☐ Using improper tool
07 ☐ Working w/out guard
08 ☐ Permitting bystanders in area
09 ☐ Other, specify_____
10 ☐ Unknown

10. Hazardous conditon involved:

24-25,01 ☐ Dull tool
02 ☐ Equipment failure
03 ☐ Improperly grounded
04 ☐ No guard or shield
05 ☐ No safety glasses
06 ☐ No safety shoes
07 ☐ Unfamiliar w/tool
08 ☐ Unsafe electrical cord
09 ☐ Unsafe speed
10 ☐ Wet floor
11 ☐ Other, specify_____
12 ☐ Unknow

11. Type of hand tool, if involved:

11-A. Shop

26-27,01 ☐ Adjustable wrench
02 ☐ Blow torch, propane torch
03 ☐ Chisel
04 ☐ Crowbar
05 ☐ File
06 ☐ Hack saw
07 ☐ Hammer
08 ☐ Pipe wrench
09 ☐ Plane
10 ☐ Pliers
11 ☐ Post-hole digger
12 ☐ Saw
13 ☐ Scissors
14 ☐ Screwdriver
15 ☐ Wood chisel

11-A. Shop(con't.)

26-27,16 ☐ Other, specify_____
17 ☐ Unknown

11-B. Other

28-29,01 ☐ Axe
02 ☐ Block and tackle
03 ☐ Cross-cut saw
04 ☐ Fork
05 ☐ Hatchet
06 ☐ Hoe
07 ☐ Machete
08 ☐ Pickaxe
09 ☐ Rope or chain
10 ☐ Scythe
11 ☐ Sickle
12 ☐ Shears
13 ☐ Shovel or spade
14 ☐ Other, specify_____
15 ☐ Unknown

12. Type of power tool, if involved:

30-31,01 ☐ Abrasive stone or grinder
02 ☐ Band saw
03 ☐ Sander, buffer, polisher
04 ☐ Chain saw
05 ☐ Electric knife
06 ☐ Impact wrench
07 ☐ Planner or jointer
08 ☐ Portable circular saw
09 ☐ Post-hole digger
10 ☐ Power hack saw
11 ☐ Radial saw
12 ☐ Power drill
13 ☐ Power winch
14 ☐ Saber saw
15 ☐ Table saw
16 ☐ Welder, electric
17 ☐ Welder, gas
18 ☐ Other, specify_____
19 ☐ Unknown

DATE EDITED_____
(Office use)

SUPPLEMENTAL
ACCIDENT REPORT FORM

Form No. NSC-F9
1-2

SLIPS AND FALLS*

Accident Report IDentification Number

3-4	5-6	7-8	9-10
County No.	Interviewer No.	Household No.	Accident No.

*NOTE:
This form to be completed for Slips and Falls resulting while victim was walking, running or climbing. DO NOT include tractor, farm equipment or livestock accidents.

Read instructions before filling out the form below.

1. Use Accident Report ID Number from the General Accident Report Form NSC-F2 previously completed for this injury.
2. This form, when completed, will be attached to the report referred to above.

1. Location of accident:

1-A. Home

11-12,01 ☐ Attic
02 ☐ Basement
03 ☐ Bathroom
04 ☐ Dining room
05 ☐ Entryway
06 ☐ Exterior stairway
07 ☐ Family room, play room, den
08 ☐ Hall or corridor
09 ☐ Interior stairway
10 ☐ Kitchen
11 ☐ Laundry room
12 ☐ Porch
13 ☐ Other, specify_____

1-B. Homeyard

13,1 ☐ Driveway
2 ☐ Garage
3 ☐ Lawn
4 ☐ Patio
5 ☐ Swimming pool
6 ☐ Walkway
7 ☐ Other, specify_____

1-C. Miscellaneous

14,1 ☐ Corn crib
2 ☐ Dairy barn
3 ☐ Ditch or pit
4 ☐ Farm lot
5 ☐ Field

1-C. Miscellaneous(con't.)

15,1 ☐ Hay mow
2 ☐ Lane
3 ☐ Livestock barn
4 ☐ Machinery shed, shop
5 ☐ Silo
6 ☐ Stairway(out-bldg.)
7 ☐ Other, specify_____
8 ☐ Unknown

2. Object involved in the injury:

16-17,01 ☐ Chain, rope, wire
02 ☐ Chair, stool
03 ☐ Basket
04 ☐ Electric cord
05 ☐ Floor
06 ☐ Floor covering
07 ☐ Hose
08 ☐ Ladder
09 ☐ Log, limb, tree
10 ☐ Pet
11 ☐ Scaffold
12 ☐ Stone
13 ☐ Swing
14 ☐ Tools
15 ☐ Toy
16 ☐ Other, specify_____
17 ☐ Unknown

3. If object was involved, was it(check one:

18,1 ☐ Being carried?
2 ☐ Being carried + awkward to handle?
3 ☐ Being carried + heavy?
4 ☐ Tripped over?
5 ☐ Other, specify_____
6 ☐ Supporting individual
7 ☐ Unknown

DATE EDITED_____
(Office use)

4. Hazard involved:

19,1 ☐ Broken object
2 ☐ Hidden object
3 ☐ Hole in object
4 ☐ Improper clothing, footwear
5 ☐ Poor lighting
6 ☐ Unsafe condition
7 ☐ Other, specify_____
8 ☐ Unknown
9 ☐ None

FOOTWEAR INFORMATION

5. Type worn at time of accident:

20-21,01 ☐ Barefeet
02 ☐ Boots(leather, rubber)
03 ☐ Flats
04 ☐ High tops
05 ☐ Oxfords
06 ☐ Pumps
07 ☐ Sandals
08 ☐ Slippers
09 ☐ Socks
10 ☐ Stockings
11 ☐ Tennis
12 ☐ Thongs
13 ☐ Wedgies
14 ☐ Wellingtons
15 ☐ Other, specify_____
16 ☐ Unknown
17 ☐ Overshoes

6. Construction of soles:

22,1 ☐ Composition
2 ☐ Cork
3 ☐ Crepe
4 ☐ Leather
5 ☐ Rubber
6 ☐ Wooden
7 ☐ Other, specify_____
8 ☐ Unknown

7. Construction of heels:

23,1 ☐ Composition
2 ☐ Cork
3 ☐ Leather
4 ☐ Rubber
5 ☐ Wooden
6 ☐ Other, specify
7 ☐ Unknown

8. Were heels equipped with metal plates?

24,1 ☐ Yes
2 ☐ No
3 ☐ Unknown

9. Heel height of footwear:

25,1 ☐ Flat
2 ☐ High
3 ☐ Medium
4 ☐ Other, specify_____
5 ☐ Unknown

10. Type of fastenings used on footwear:

26,1 ☐ Buckles
2 ☐ Elastic
3 ☐ Laced
4 ☐ Straps
5 ☐ None
6 ☐ Other, specify_____
7 ☐ Unknown

11. Condition of footwear:

27,1 ☐ Good
2 ☐ New
3 ☐ Worn
4 ☐ Need repair
5 ☐ Other, specify_____
6 ☐ Unknown

12. Were shoes of proper size and fit?

28,1 ☐ Yes
2 ☐ No
3 ☐ Unknown

DATE EDITED_____
(Office use)

SUPPLEMENTAL ILLNESS REPORT FORM

Form No. NSC-F10

1-2

Illness Report IDentification Number

3-4 County No. | 5-6 Interviewer No. | 7-8 Household No. | 9-10 Illness No.

Read instructions before filling out form.

1. Use a separate Illness report form for each person affected.
2. Fill-in County and Interviewer Household No. is obtained from Quarterly Report Form.
3. Assign the Illness No. from NSC-F2 (Rev.)

1. If illness was encountered in a building, check most applicable contributing condition(Check only one.):

11-12,01 ☐ Fumes from paints, varnishes, etc.
02 ☐ Build-up of engine exhaust fumes
03 ☐ Build-up of livestock waste gases
04 ☐ Build-up of fermentation gases (silo, etc.)
05 ☐ Medicine
06 ☐ Insecticides being used
07 ☐ Pesticides being used
08 ☐ Conditions unknown
09 ☐ Other, specify _____
10 ☐ Does not apply

2. If illness was encountered outside of a building, check most applicable contributing condition(Check only one):

13,1 ☐ Fertilizer application
2 ☐ Ammonia application
3 ☐ Insecticide application
4 ☐ Pesticide application
5 ☐ Herbicide application
6 ☐ Medicine
7 ☐ Conditions unknown
8 ☐ Other, specify _____
9 ☐ Does not apply

3. Activity prior to becoming ill:

14,1 ☐ Soil preparation and planting
2 ☐ Crop cultivation or treatment
3 ☐ Crop harvesting
4 ☐ Livestock care and treatment
5 ☐ Feed handling or processing
6 ☐ Other, specify _____
7 ☐ Unknown
8 ☐ Does not apply

4. Type of illness:

15-16,01 ☐ Allergy
02 ☐ Cold, flu
03 ☐ Fainting
04 ☐ Headache
05 ☐ Heat exhaustion
06 ☐ Dust disease of the lungs
07 ☐ Skin disorder or disease
08 ☐ Nausea
09 ☐ Upset stomach
10 ☐ Respiratory conditions due to toxic agents
11 ☐ Poisoning(from sprays, gases, solvents and other toxic compounds)
12 ☐ Other, specify _____

Sheet 1 of 1

DATE EDITED _____ (Office use)

SUPPLEMENTAL

ACCIDENT REPORT FORM

Form No. NSC-F11

1-2

WAGONS, AGRICULTURAL

ACCIDENT REPORT IDENTIFICATION NUMBER

3-4 County No. _____ 5-6 Interviewer No. _____ 7-8 Household No. _____ 9-10 Accident No. _____

Wagon Identification:

Make _____

Model _____

Read instructions before filling out the form below.

1. Use Accident Report ID Number from the General Accident Report (Form No. NSC-F2) previously completed for this injury.
2. This form, when completed will be attached to the report referred to above.

1. Wagon Data:

1-A. Approximate age of wagon

11-12 _____ Years (Fill-in)

1-B. Number of axles

13 _____ (Fill-in)

1-C. Type of wagon involved

14-15,01 ☐ Flat rack
02 ☐ Stock rack
03 ☐ Grain w/ hydraulic power
04 ☐ Grain, gravity
05 ☐ Grain, auger
06 ☐ Other, specify _____
07 ☐ Forage
08 ☐ Cotton
09 ☐ Box
10 ☐ Manure spreader
11 ☐ Tank
12 ☐ Unknown

1-D. Running gear component (Check item contributing to the accident)

16-17,01 ☐ Bolster, front
02 ☐ Bolster, rear
03 ☐ Brakes
04 ☐ Hitch
05 ☐ Hitch pin
06 ☐ Hound (reach braces)
07 ☐ None
08 ☐ Reach
09 ☐ Steering arm
10 ☐ Steering rod
11 ☐ Tires, wheels

1-E. Wagon condition at time of accident (Check contributing factors)

18 ☐ Damaged shields
19 ☐ Good condition
20 ☐ Guard removed
21 ☐ Improperly hitched
22 ☐ Inadequate guarding
23 ☐ Lacked shut-off or safety bar
24 ☐ Poor condition
25 ☐ Other, specify _____

2. Indicate type of accident:

26-27,01 ☐ Collision, from the side
02 ☐ Collision, head-on
03 ☐ Collision, rear
04 ☐ Equipment failure
05 ☐ Fall
06 ☐ Overturn, sideways
07 ☐ PTO
08 ☐ Runover
09 ☐ Unknown
10 ☐ Other, specify _____

3. Portion of equipment causing injury:

28-29,01 ☐ Auger
02 ☐ Beater
03 ☐ Cable or linkage
04 ☐ Chain or sprockets
05 ☐ Control device (pedal, lever, etc.)
06 ☐ Feeding mechanism
07 ☐ Gears
08 ☐ Hitch or drawbar
09 ☐ Hydraulic fluid
10 ☐ Hydraulic hose
11 ☐ PTO shaft
12 ☐ Rotating shaft, except PTO
13 ☐ Tire or wheel
14 ☐ V-belt or pulley
15 ☐ Wagon box or bed
16 ☐ None
17 ☐ Other, specify _____

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4. Approximate number of hours victim was w/or around wagon on day of accident:

30-31 _____hours(Fill-in)

5. Act leading to accidental injury:

32-33 01 ☐ Disobeyed traffic rules
02 ☐ Distracted
03 ☐ Failed to disengage PTO
04 ☐ Failure to use protective equipment
05 ☐ Failed to lock brakes or transmission
06 ☐ Failed to wear safe personal attire
07 ☐ Horseplay
08 ☐ Improper use of equipment
09 ☐ Inattentive
10 ☐ Jumped
11 ☐ Lost balance
12 ☐ Permitted rider(s)
13 ☐ Reaching(over, under, into)
14 ☐ Too fast for conditions
15 ☐ Turning at high speed
16 ☐ Unsafe position or posture
17 ☐ Other, specify_____
18 ☐ Unknown

6. How did injury occur?(Check response closely describing accident):

34 1 ☐ Caught part of body in something
2 ☐ Caught part of body between
3 ☐ Contact with sharp object
4 ☐ Fall, different level
5 ☐ Fall, same level
6 ☐ Foreign object or material lodged in victim
7 ☐ Struck by flying object or material
8 ☐ Struck against or by object, etc.
9 ☐ Other, specify_____

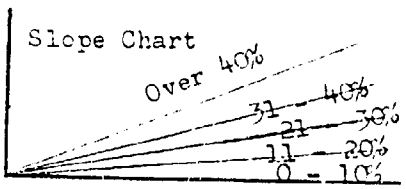
7. Scene of Accident:

7-A. Location

35-36 01 ☐ Barn
02 ☐ Barnyard
03 ☐ Bridge
04 ☐ Cattle shed
05 ☐ Corn field
06 ☐ Cotton field
07 ☐ Driveway
08 ☐ Feedlot
09 ☐ Grain field
10 ☐ Granary
11 ☐ Highway(state or federal)
12 ☐ Road(county or township)
13 ☐ Other, specify_____
14 ☐ Unknown
15 ☐ Hay field
16 ☐ Hog house
17 ☐ Machine shed
18 ☐ Orchard
19 ☐ Pasture
20 ☐ Poultry house
21 ☐ Shop
22 ☐ Silo, bunker
23 ☐ Silo, trench
24 ☐ Woods

7-B. Slope of surface at accident scene:

37 1 ☐ 0 to 10%
2 ☐ 11 to 20%
3 ☐ 21 to 30%
4 ☐ 31 to 40%
5 ☐ Over 40%



8. Wagon movement & hitching:

38	Single	Tandem
Backward	1 ☐	4 ☐
Forward	2 ☐	5 ☐
Stationary	3 ☐	6 ☐

9. Wagon action at time of accident:

39 1 ☐ In a skid
2 ☐ Normal
3 ☐ Parked
4 ☐ Other, specify_____
5 ☐ Runaway
6 ☐ Stuck
7 ☐ None

Describe how the event occurred, including the action or movement of the victim and the wagon involved that led to the injury. Additional information will be most helpful.

DATE EDITED_____
(Office use)

SUPPLEMENTAL ACCIDENT REPORT FORM

Form No. NSC-F12

1-2

LAWN, GARDEN & MISCELLANEOUS POWERED EQUIPMENT

Accident Report Identification Number

3-4	5-6	7-8	9-10
County No.	Interviewer No.	Household No.	Accident No.

Machine Identification

Make _____

Model _____

Read instructions before filling out the form below.

1. Use Accident Report ID Number from the General Accident Report (Form No. NSC-F2) previously completed for this injury.
2. This form, when completed will be attached to the report referred to above.

1. Type of machine involved in accident:

11, 1 ☐ Garden
2 ☐ Lawn
3 ☐ Recreation
4 ☐ Other, specify _____

2. Machine involved in the accident:

Lawn

12-13, 01 ☐ Hedge Clipper
02 ☐ Powered edger
03 ☐ Powered thatcher
04 ☐ Reel type mower
05 ☐ Reel type mower, mtd.
06 ☐ Riding mower
07 ☐ Rotary mower
08 ☐ Rotary mower, mtd.
09 ☐ Shredder, compost mill
10 ☐ Snow blower
11 ☐ Snow blower, mtd.
12 ☐ Other lawn, specify _____

Garden

13 ☐ Riding tractor (less than 20hp) (Complete Form NSC-F4 also if this unit is checked)
14 ☐ Rotary tiller
15 ☐ Other garden, specify _____

Recreation or Work

16 ☐ Motor-bike
17 ☐ Motorcycle
18 ☐ Motor Scooter
19 ☐ Snowmobile
20 ☐ Other, recreation, specify _____

3. Approximate age of machine:

14, 1 ☐ One year or less
2 ☐ 2 to 5 years
3 ☐ 6 to 10 years
4 ☐ Over 10 years
5 ☐ Unknown

4. Equipment powered by (Check one):

15, 1 ☐ Electric motor
2 ☐ Engine, gas, diesel, LP
3 ☐ Hand
4 ☐ Other, specify _____

5. Equipment propelled by (Check one):

16, 1 ☐ Self-propelled
2 ☐ Push type
3 ☐ Towed
4 ☐ Other, specify _____

6. Condition at time of accident:

17-18, 01 ☐ Damaged guard
02 ☐ Equipment failure
03 ☐ Good condition
04 ☐ Grease, oil present
05 ☐ Guard not provided
06 ☐ Guard removed
07 ☐ Improper hitch
08 ☐ Leaking or spilled fuel
09 ☐ No brakes
10 ☐ Poor brakes
11 ☐ Other, specify _____

DATE EDITED _____
(Office use)

7. Portion of machine causing injury:

19-20,01 ☐ Cable or linkage
02 ☐ Chain & sprocket
03 ☐ Control devices (pedals, levers, etc.)
04 ☐ Cutterhead
05 ☐ Gears
06 ☐ Hammers
07 ☐ Hitch or drawbar
08 ☐ Hydraulic fluid
09 ☐ Hydraulic hose
10 ☐ Knife blade
11 ☐ Lifting mechanism
12 ☐ PTO shaft
13 ☐ Rotating shaft, except PTO
14 ☐ Spindles, etc.
15 ☐ Tire or wheel
16 ☐ V-belt & pulley
17 ☐ Other, specify_____
18 ☐ None

8. Activity of injured person prior to accident:

21-22,01 ☐ Adjusting
02 ☐ Bystander
03 ☐ Cleaning
04 ☐ Lubricating
05 ☐ Operating
06 ☐ Refueling
07 ☐ Repairing
08 ☐ Riding
09 ☐ Other, specify_____
10 ☐ Unknown

9. Act permitting the accidental injury:

23-24,01 ☐ Distraction
02 ☐ Horseplay
03 ☐ Improper use of equipment
04 ☐ Inattentive
05 ☐ Jumped
06 ☐ Lost control
07 ☐ Permitted extra rider(s)
08 ☐ Allowed by-stander(s)
09 ☐ Reaching (over, under, into)
10 ☐ Too fast for conditions
11 ☐ Unsafe position or posture
12 ☐ Working w/out guard in-place
13 ☐ Other, specify_____

10. Specific scene of accident:

25-26,01 ☐ Barn
02 ☐ Bridge
03 ☐ Cattle shed
04 ☐ Crop field
05 ☐ Driveway, lane
06 ☐ Feedlot
07 ☐ Garden
08 ☐ Highway
09 ☐ Hog house
10 ☐ Lawn, yard
11 ☐ Machine shed
12 ☐ Orchard
13 ☐ Pasture
14 ☐ Poultry house
15 ☐ Shop
16 ☐ Woods
17 ☐ Other, specify
18 ☐ Unknown_____

11. Additional information concerning the accident may be described in the space below:

_____

_____

_____

DATE EDITED_____
(Office use)

Form No. NSC-F13
1-2

TRACTOR AND MACHINERY OPERATOR EDUCATIONAL INFORMATION

Educational Information IDentification Number

3-4	5-6	7-8	9-10
County No.	Interviewer No.	Household No.	Accident No.

Operator's First Name: _____

Age: _____(Fill-in) years

Read instructions before filling out the form below.

1. Fill-in your County No. and Interviewer No. as requested.
2. The ID Number assigned to this household, shown on the Master Data Sheet(NSC-F1), should be inserted as requested. The Accident No., when it applies, will be inserted at survey headquarters.

1. Formal education - highest grade completed:

50,1 ☐ 8th grade
2 ☐ 12th grade
3 ☐ 1 year college/university
4 ☐ 2 years college/university
5 ☐ 3 years college/university
6 ☐ 4 years college/university
7 ☐ Advanced degree or training
8 ☐ Other, specify_____

2. Special Education or Training:

A. 4-H Petroleum Power Program

51,1 ☐ First year Tractor Project
2 ☐ Second year Tractor Project
3 ☐ Third year Tractor Project
4 ☐ Fourth year Tractor Project
5 ☐ Fourth year Machinery Project
6 ☐ Advanced years, Tractor/Machinery Project
7 ☐ Other, specify_____

B. Vocational Agriculture Training Program

52,1 ☐ Safe Tractor Operation
2 ☐ Safe Farm Machinery Operation

C. Hazardous Occupations Tractor and Machinery Training

Completed Course:

53,1 ☐ No
2 ☐ Yes

3. Operator has served in leadership position in any of the above training programs:

54,1 ☐ No
2 ☐ Yes

4. Approximate hours of operator training:

55-57_____(Fill-in) hours

Sheet 1 of 1

DATE EDITED_____
(Office use)

SUPPLEMENTAL ACCIDENT REPORT FORM

Form No. NSC-F14
1—2

AGRICULTURAL TRUCKS

Accident Report IDentification Number

3—4 County No. _____ 5—6. Interviewer No. _____ 7—8 Household No. _____ 9—10 Accident No. _____

Truck Identification:

Make: _____ Model: _____

Fuel type: Gas Diesel LP

Accident Occurred:

11,1 ☐ On the farm 2 ☐ Off the farm

Read instructions before filling out the form below.

1. Use Accident Report ID Number from the General Accident Report Form NSC-F2 previously completed for this injury.
2. This form, when completed, will be attached to the report referred to above.

1. Type of truck involved in accident:

12,1 ☐ Pick-up, 2-wheel drive
2 ☐ Pick-up, 4-wheel drive
3 ☐ Truck, straight
4 ☐ Truck, semi-trailer

2. Truck equipped with:

13—14,01 ☐ Box
02 ☐ Box w/hydraulic lift, rear dump
03 ☐ Box w/hydraulic lift, side dump
04 ☐ Box w/belt conveyor
05 ☐ Box w/auger
06 ☐ Box w/gravity unload
07 ☐ Flat bed
08 ☐ Flat bed w/hydraulic lift
09 ☐ Stock rack
10 ☐ Tank
11 ☐ Other, specify _____

3. Truck also equipped with: (check one or more)

15 ☐ 2-way radio
16 ☐ 4-door cab
17 ☐ 5th wheel attachment
18 ☐ Automatic transmission
19 ☐ Manual transmission

4. Emergency equipment on truck:

20,1 ☐ None
2 ☐ Fire extinguisher
3 ☐ Fusees
4 ☐ Reflector flares
5 ☐ Flags
6 ☐ Other, specify _____

5. Approximate age of truck:

21,1 ☐ One year or less
2 ☐ 2 to 5 years
3 ☐ 6 to 10 years
4 ☐ Over 10 years

6. Indicate type of accident:

22—23,01 ☐ Collision, from the side
02 ☐ Collision, head-on
03 ☐ Collision, rear
04 ☐ Collision, sideswipe
05 ☐ Drove into ditch
06 ☐ Equipment failure
07 ☐ Fall
08 ☐ Overturn
09 ☐ Pto
10 ☐ Struck stationary object
11 ☐ Other, specify _____

7. Number of vehicles involved in accident:

24,1 ☐ One 2 ☐ Two 3 ☐ Three or more

8. Truck use at time of accident (Check one):

25,1 ☐ Freeing mired equipment
2 ☐ In-transit
3 ☐ Loading
4 ☐ Spreading
5 ☐ Parked, engine running
6 ☐ Parked, engine stopped
7 ☐ Unloading
8 ☐ Stuck
9 ☐ Other, specify _____

DATE EDITED _____ (Office use)

9. Slope of surface at scene of accident: (Check one)

26,1 ☐ 0 to 10%
2 ☐ 11 to 20%
3 ☐ 21 to 30%
4 ☐ 31 to 40%
5 ☐ Over 40%

10. Truck condition prior to accident:

27,1 ☐ No defects
2 ☐ Brakes, poor
3 ☐ Tires, poor
4 ☐ Wipers, poor
5 ☐ Lighting, poor
Mirrors(rear-view)
6 ☐ Poor
7 ☐ Not available

11. Truck movement at time of accident:

28,1 ☐ Backward
2 ☐ Forward
3 ☐ Stationary
4 ☐ Unknown

12. Truck action prior to accident:

29,1 ☐ In a skid
2 ☐ Stuck
3 ☐ Turning
4 ☐ Stopped in traffic lane
5 ☐ Other, specify _____
6 ☐ Runaway
7 ☐ Passing
8 ☐ Parked

13. Scene of accident:

30-31,01 ☐ Barn
02 ☐ Barnyard
03 ☐ Bridge
04 ☐ Cattle shed
05 ☐ Corn field
06 ☐ Cotton field
07 ☐ Driveway
08 ☐ Farm road
09 ☐ Grain field
10 ☐ Granary
11 ☐ Highway(state or federal)
12 ☐ Road(county or township)
13 ☐ Other, specify _____
14 ☐ Hay field
15 ☐ Machine shed
16 ☐ Orchard
17 ☐ Pasture
18 ☐ Shop
19 ☐ Silo, bunker
20 ☐ Silo, trench
21 ☐ Beet field
22 ☐ Potato field
23 ☐ Farm warehouse

14. Condition of driving surface:

32,1 ☐ Under repair
2 ☐ Holes and/or ruts
3 ☐ Loose gravel
4 ☐ Muddy
5 ☐ Snowy, icy
6 ☐ Washboard
7 ☐ No defects
8 ☐ Other, specify

15. Activity of injured person prior to accident:

33-34,01 ☐ Adjusting
02 ☐ Cleaning
03 ☐ Driving
04 ☐ Lubricating
05 ☐ Repairing, installing equipment
06 ☐ Riding ouside of cab
07 ☐ Not involved with vehicle
08 ☐ Other, specify _____
09 ☐ Unknown
10 ☐ Loading
11 ☐ Unloading
12 ☐ Refueling
13 ☐ Riding in cab

16. Act leading to accidental injury:

35-36,01 ☐ Distracted
02 ☐ Driving while drowsy
03 ☐ Driving while under the influence
04 ☐ of alcohol or drugs
05 ☐ Driving while ill
06 ☐ Failed to check clearance
07 ☐ Failed to signal properly
08 ☐ Failed to yield right-of-way
09 ☐ Failed to place chucks under wheels
10 ☐ Failed to disengage PTO
11 ☐ Failed to set emergency brakes
12 ☐ Horseplay
13 ☐ Illegal passing
14 ☐ Improper use of equipment
15 ☐ Inattentive
16 ☐ Jumped
17 ☐ Lost balance
18 ☐ Permitted extra rider(s)
19 ☐ Reaching(over, under, into)
20 ☐ Too fast for conditions
21 ☐ Overloaded
22 ☐ Other, specify _____

17. Did vehicle have state inspection sticker?

37,1 ☐ Yes 2 ☐ No 3 ☐ Unknown

18. If "No," is inspection required?

38,1 ☐ Yes 2 ☐ No 3 ☐ Unknown

19. Was driver of vehicle involved, licensed?

39,1 ☐ Yes 2 ☐ No 3 ☐ Unknown

DATE EDITED _____
(Office use)

Form No.
WVU-F15

SUPPLEMENTAL ACCIDENT REPORT FORM

Forestry and Woodlot Activities

3-4 County No. | 5-6 Interviewer No. | 7-8 Household No. | 9-10 Accident No.

READ INSTRUCTIONS BEFORE FILLING OUT THE FORM BELOW

1. Use Accident Report ID Number from the General Accident Report (Form No. NSC-F2) previously completed for this injury.
2. This form, when completed will be attached to the report referred to above.

---

1. Type of equipment involved in accident

11-12, 1 ☐ Ax (In addition complete form NSC-F8)
2 ☐ Chainsaw (In addition complete form NSC-F8)
3 ☐ Crosscut saw (In addition complete form NSC-F8)
4 ☐ Wedges (In addition complete form NSC-F8)
5 ☐ Hammers (In addition complete form NSC-F8)
6 ☐ Wire Rope/Cable
7 ☐ Chains
8 ☐ Chokers
9 ☐ None
10 ☐ Other, Specify_____

2. Type of machinery involved in accident

13-14, 1 ☐ Farm tractor (In addition complete Form NSC-F4)
2 ☐ Track vehicle
3 ☐ Rubber-tired skidder
4 ☐ Front-end loader
5 ☐ Circular sawmill
6 ☐ Cut off saw
7 ☐ Trim saw
8 ☐ Truck/Hauling vehicle (In addition complete NSC-F11 or NSC-F14 whichever is appropriate)
9 ☐ Edger saw
10 ☐ Feed rollers
11 ☐ None
12 ☐ Other, Specify_____

3. Approximate age of machinery involved in accident

15, 1 ☐ No machinery involved
2 ☐ 1 year or less
3 ☐ 2 to 5 years
4 ☐ 6 to 10 years
5 ☐ Over 10 years
6 ☐ Unknown

4. Portion of machine causing injury

16-17, 1 ☐ No machinery involved
2 ☐ Cable or linkage
3 ☐ Chain and sprocket
4 ☐ Control devices
5 ☐ Gears
6 ☐ Hitch or drawbar
7 ☐ Hydraulic fluid
8 ☐ Hydraulic hose
9 ☐ Blades/knives or teeth
10 ☐ Lifting mechanism
11 ☐ PTO shaft
12 ☐ Rotating shaft, except PTO
13 ☐ Spindles, etc.
14 ☐ Tires or wheels
15 ☐ V belt and pulley
16 ☐ Other, Specify_____

5. Principle activity of injured person prior to accident

18-19,1 ☐ Cruising
2 ☐ Marking
3 ☐ Road Building
4 ☐ Falling
5 ☐ Bucking
6 ☐ Limbing
7 ☐ Log hauling
8 ☐ Loading
9 ☐ Transporting
10 ☐ Unloading
11 ☐ Splitting, cutting, notching, etc.
12 ☐ Maintenance
13 ☐ Sawmilling, edging or trimming
14 ☐ Lumber or cordwood stacking/unstacking
15 ☐ Bystander
16 ☐ Unknown

6. Secondary activity of injured person prior to accident

20-21,1 ☐ Adjusting
2 ☐ Bystander
3 ☐ Cleaning
4 ☐ Lubricating
5 ☐ Operating
6 ☐ Refueling
7 ☐ Repairing
8 ☐ Riding
9 ☐ Other, Specify_____
10 ☐ Unknown

7. Act permitting the accidental injury

22-23,1 ☐ Distraction
2 ☐ Horseplay
3 ☐ Improper use of equipment/machinery
4 ☐ Inattentive
5 ☐ Jumped
6 ☐ Lost control
7 ☐ Permitted extra rider(s)
8 ☐ Reaching (over, under, into)
9 ☐ Too fast for conditions
10 ☐ Falling object from above
11 ☐ Working w/out guard in place
12 ☐ No personal protective equipment
13 ☐ Other, Specify_____

8. Specific scene of accident

24,1 ☐ Farm yard
2 ☐ Woodlot
3 ☐ Farm roads
4 ☐ Machinery storage or maintenance area
5 ☐ Sawmill
6 ☐ Log or pulpwood storage area

9. Slope of surface at accident scene

25,1 ☐ 0 to 10%
2 ☐ 11 to 20%
3 ☐ 21 to 30%
4 ☐ 31 to 40%
5 ☐ Over 40%

NONAGRICULTURAL ACCIDENT REPORT FORM

Form NSC-FN
Rev. 2

INSTRUCTIONS: Use a separate sheet for each person injured. Use this Accident Report IDentification Number on all forms pertaining to this accident. It is very important that the County, Interviewer, and Household numbers are entered correctly so that this report can be matched with the Master Data Sheet for this farm.

Accident Report IDentification Number:
Form: FN (1-2)

1. Fill in your County number . . . . . County: (3-4)

2. Fill in your Interviewer number . . . . . Interviewer: (5-6)

3. Enter the Household number for this farm from your Household IDentification List . . . . . Household: (7-8)

4. Assign the accident number in the order that each is reported for this farm . . . . . Accident: (9-10)

5. Use a different person number for each one injured in this accident. First name of injured: _____. Person: (11-12)

Describe briefly how the accident happened, including what the person was doing, what objects or substances were involved, and what actions and events led to the injury (use the back of this sheet if necessary):

1. Age of victim:
(13-14) _____

2. Sex of the victim:
(15-16) 01 ☐ Male 02 ☐ Female

3. Month in which the accident occurred:
(17-18) 01 ☐ Jan 05 ☐ May 09 ☐ Sep
02 ☐ Feb 06 ☐ Jun 10 ☐ Oct
03 ☐ Mar 07 ☐ Jul 11 ☐ Nov
04 ☐ Apr 08 ☐ Aug 12 ☐ Dec

4. Activity at the time of the accident:
(19-20) 01 ☐ Work 02 ☐ Nonwork

5. Severity of the injury:
(21-22) 01 ☐ Slight--no medical treatment except bandage, antiseptic, etc
02 ☐ Severe--broken bone, cut requiring treatment, sprained back
03 ☐ Permanent--any loss of full use of any body part, amputation
04 ☐ Fatal

6. Nature of the injury:
(23-24) 01 ☐ Cut/puncture/laceration
02 ☐ Sprain/strain
03 ☐ Bruise/scrape/contusion
04 ☐ Fracture/dislocation
05 ☐ Burn/scald
06 ☐ Swallowed harmful substance
07 ☐ Breathed harmful gases/fumes
08 ☐ Concussion
09 ☐ Electric shock
10 ☐ Other _____

6. Part of body injured:
(25-26) 01 ☐ Head, except face
02 ☐ Face
03 ☐ Eye
04 ☐ Neck
05 ☐ Shoulder
06 ☐ Back
07 ☐ Chest
08 ☐ Abdomen
09 ☐ Arm
10 ☐ Hand, including wrist
11 ☐ Leg
12 ☐ Foot, including ankle
13 ☐ Multiple parts
14 ☐ Other _____

7. Location of accident:
(27-28) 01 ☐ Home
02 ☐ Barn
03 ☐ Other farm building
04 ☐ Homeyard
05 ☐ Garage/driveway
06 ☐ Barnyard
07 ☐ Field
08 ☐ Other place on the farm
09 ☐ Street/highway
10 ☐ School
11 ☐ Store/office/public building
12 ☐ Other public place outdoors
13 ☐ Other place _____

8. Type of accident:
(29-30) 01 ☐ Contact with sharp object
02 ☐ Fall on same level
03 ☐ Fall from one level to another
04 ☐ Struck by or against object
05 ☐ Moving motor-vehicle accident
06 ☐ Breathing/swallowing substance
07 ☐ Overexertion or bodily movement
08 ☐ Contact with fire, hot object or hot substance
09 ☐ Bite or sting
10 ☐ Firearms accident
11 ☐ Drowning or submersion
12 ☐ Other _____

9. Thing associated with the injury:
(31-32) 01 ☐ Motor-vehicle (auto, truck, etc)
02 ☐ Motorcycle/motorscooter
03 ☐ Bicycle/tricycle
04 ☐ Other vehicle (snowmobile, etc)
05 ☐ Sports or recreation equipment
06 ☐ Furniture/furnishings/fixtures
07 ☐ Animal or insect
08 ☐ Knife or other cutting tool
09 ☐ Container (glass, metal, plastic)
10 ☐ Ladder
11 ☐ Lawnmower
12 ☐ Tool (hand or power)
13 ☐ Farm equipment
14 ☐ Home appliance
15 ☐ Home maintenance product
16 ☐ Personal care product
17 ☐ Medicine
18 ☐ Part of building or structure
19 ☐ Part of outdoor environment
20 ☐ None
21 ☐ Other _____

APPENDIX B

FREQUENCY AND PER CENT DISTRIBUTIONS

VARIABLE: 01...STATE FILE: FARMJI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00...[illegible]S/UA	0	.00	
01...ALABAMA	47	1.14	1.14
02...CALIF	210	5.12	5.12
03...[illegible]ARYLAND	126	3.07	3.07
04...[illegible]ISSOURI	119	2.90	2.90
05...[illegible]TAH	103	2.51	2.51
06...[illegible]RIZONA	43	1.05	1.05
07...IDAHO	253	6.16	6.16
08...[illegible]EORGIA	20	.49	.49
09...KANSAS	197	4.80	4.80
10...[illegible]ENNA	183	4.46	4.46
11... [illegible]ISCONSN	311	7.58	7.58
12...IOWA	440	10.72	10.72
13...[illegible]KLAHOMA	75	1.83	1.83
14...[illegible]ONTANA	34	.83	.83
15...S DAKOTA	56	1.36	1.36
16...INDIANA	94	2.29	2.29
17...[illegible] MEXICO	24	.58	.58
18...[illegible]EW YORK	137	3.34	3.34
19...VERMONT	60	1.46	1.46
20...[illegible]EW HAMP	37	.90	.90
21...DELAWARE	45	1.10	1.10
22...[illegible]EBRASKA	191	4.65	4.65
23...COLORADO	59	1.44	1.44
24...ARKANSAS	164	4.00	4.00
25...CONN	4	.10	.10
26...WASHNGTN	64	1.56	1.56
27...OREGON	187	4.56	4.56
28...VIRGINIA	40	.97	.97
29...UTAH II	121	2.95	2.95
30...MICHIGAN	49	1.19	1.19
31...TENNESSE	80	1.95	1.95
32...KANS II	147	3.58	3.58
33...GEOR II	48	1.17	1.17
34...S CALIF	82	2.00	2.00
35...IOWA II	255	6.21	6.21
TOTAL	4105	100.02	100.02

VARIABLE: 02...RESIDENCY FILE: FARMI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00... S/NA	15	.37	
01... HSBAND	1848	45.02	45.18
02...WIFE	408	9.94	9.98
03...SON	687	16.74	16.80
04...DAUGHTER	101	2.46	2.47
05...OTHER	123	3.00	3.01
06...FT EMPL	506	12.33	12.37
07...PT EMPL	379	9.23	9.27
08...VISITOR	25	.61	.61
09...GUEST	13	.32	.32
TOTAL	4105	100.02	100.01

VARIABLE: 03...AGE FILE: FARMI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00... S/NA	0	.00	
01... 1- 4 YR	10	.24	.24
02... 5-14 YR	236	5.75	5.75
03...15-24 YR	855	20.83	20.83
04...25-44 YR	1347	32.81	32.81
05...45-64 YR	1219	29.70	29.70
06...65, OVER	228	5.55	5.55
07... UNKNOWN	210	5.12	5.12
TOTAL	4105	100.00	100.00

VARIABLE: 04...SEX FILE: FARMI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00... S/NA	17	.41	
01...MALE	3489	84.99	85.35
02...FEMALE	599	14.59	14.65
TOTAL	4105	99.99	100.00

VARIABLE: 05...NMBR INJRD FILE: FARMNI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00... NS/NA	0	.00	
01... ONE	4023	98.00	98.00
02... TWO	44	1.07	1.07
03... THREE	4	.10	.10
04... 4, MORE	1	.02	.02
05... UNKNOWN	33	.80	.80
TOTAL	4105	99.99	99.99

VARIABLE: 06...WK-LEISURE FILE: FARMNI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00... NS/NA	0	.00	
01... WORK	4105	100.00	100.00
02... LEISURE	0	.00	.00
03... UNKNOWN	0	.00	.00
TOTAL	4105	100.00	100.00

VARIABLE: 07...MONTH FILE: FARMNI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00... NS/NA	6	.15	
01... JANUARY	238	5.80	5.81
02... FEBRUARY	272	6.63	6.64
03... MARCH	344	8.38	8.39
04... APRIL	361	8.79	8.81
05... MAY	386	9.40	9.42
06... JUNE	442	10.77	10.78
07... JULY	472	11.50	11.52
08... AUGUST	365	8.89	8.90
09... SEPTEMBR	341	8.31	8.32
10... OCTOBER	358	8.72	8.73
11... NOVEMBER	276	6.72	6.73
12... DECEMBER	231	5.63	5.64
13... UNKNOWN	13	.32	.32
TOTAL	4105	100.01	100.01

VARIABLE: 05...DAY/WEEK FILE: FARMI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00... NS/NA	782	19.05	
01...SUN.	230	5.60	6.92
02...MON.	465	11.28	13.93
03...TUES.	511	12.45	15.38
04...WED.	499	12.16	15.02
05...THURS.	464	11.30	13.96
06...FRI.	451	10.99	13.57
07...SAT.	454	11.06	13.65
08...DON'T KNOW	251	6.11	7.55
TOTAL	4105	100.00	99.99

VARIABLE: 09...TIME/DAY FILE: FARMI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00... NS/NA	782	19.05	
01... 1 A.M.	13	.32	.39
02... 2 A.M.	42	1.02	1.26
03... 3 A.M.	42	1.02	1.26
04... 4 A.M.	54	1.32	1.63
05... 5 A.M.	54	1.32	1.63
06... 6 A.M.	68	1.66	2.05
07... 7 A.M.	101	2.46	3.04
08... 8 A.M.	132	3.22	3.97
09... 9 A.M.	237	5.77	7.13
10...10 A.M.	412	10.04	12.40
11...11 A.M.	282	6.87	8.49
12... NOON	58	1.41	1.75
13... 1 P.M.	137	3.34	4.12
14... 2 P.M.	315	7.67	9.48
15... 3 P.M.	300	7.31	9.03
16... 4 P.M.	304	7.41	9.15
17... 5 P.M.	217	5.29	6.53
18... 6 P.M.	148	3.61	4.45
19... 7 P.M.	110	2.68	3.31
20... 8 P.M.	51	1.24	1.53
21... 9 P.M.	22	.54	.66
22...10 P.M.	10	.24	.30
23...11 P.M.	10	.24	.30
24... MIDNIGHT	33	.80	.99
25... DON'T KNOW	171	4.17	5.15
TOTAL	4105	100.02	100.00

VARIABLE: 10...INJRY/ILL FILE: FARMNI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00... S/NA	0	.00	
01...INJURED	4105	100.00	100.00
02...ILL	0	.00	.00
TOTAL	4105	100.00	100.00

VARIABLE: 11...SEVERITY FILE: FARMNI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00...NS/NA	5	.12	
01...SLIGHT	1239	30.18	30.22
02...SEVERE	2683	65.36	65.44
03...PERM.	80	1.95	1.95
04...FATAL	30	.73	.73
05...UNKNOWN	68	1.66	1.66
TOTAL	4105	100.00	100.00

VARIABLE: 12...ACTIVITY FILE: FARMNI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00...NS/NA	64	1.56	
01...BLDG MNT	263	6.41	6.51
02...FLD WORK	826	20.12	20.44
03...USE WORK	82	2.00	2.03
04...MACH MNT	531	12.94	13.14
05...RECREATN	7	.17	.17
06...CHORES	1005	24.48	24.87
07...LIVESTCK	430	10.48	10.64
08...YRD WORK	110	2.68	2.72
09...OTHER	787	19.17	19.48
TOTAL	4105	100.01	100.00

VARIABLE: 13...ACTION FILE: FARMWI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00...NS/NA	82	2.00	
01...CLIMBING	274	6.67	6.81
02...DRIVING	173	4.21	4.30
03...JUMPING	125	3.05	3.11
04...KNEELING	195	4.75	4.85
05...LIFTING	474	11.55	11.78
06...LYING DN	28	.68	.70
07...RIDING	196	4.77	4.87
08...SHUNTING	113	2.75	2.81
09...SITTING	103	2.51	2.56
10...STANDING	1384	33.71	34.40
11...WALKING	569	13.86	14.14
12...OTHER	389	9.48	9.67
TOTAL	4105	99.99	100.00

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VARIABLE: 14...1ST AID BY FILE: FARMWI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00...NS/NA	878	21.39	
01...DOCTOR	1898	46.24	58.82
02...FAMILY	486	11.84	15.06
03...NURSE	84	2.05	2.60
04...SELF	481	11.72	14.91
05...MULTIPLE	91	2.22	2.82
06...OTHER	187	4.56	5.79
TOTAL	4105	100.02	100.00

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VARIABLE: 15...NO TREATED FILE: FARMWI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00...NS/NA	826	20.12	
01...NOT REQD	251	6.11	7.65
02...ONE	1053	25.65	32.11
03...2, MOR	1975	48.11	60.23
TOTAL	4105	99.99	99.99

VARIABLE: 16...TYPE INJRY FILE: FARINI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00...NS/NA	64	1.56	
01...AMPUTATN	63	1.53	1.56
02...ASPHYXIA	5	.12	.12
03...BRUISE	507	12.35	12.55
04...BURN	90	2.19	2.23
05...FRACTURE	626	15.25	15.49
06...CUT	975	23.75	24.13
07...EYE INJ	222	5.41	5.49
08...MANGLED	53	1.29	1.31
09...PINCHED	55	1.34	1.36
10...PUNCTURE	224	5.46	5.54
11...SPRAIN	638	15.54	15.79
12...MULTIPLE	212	5.16	5.25
13...OTHER	371	9.04	9.18
TOTAL	4105	99.99	100.00

VARIABLE: 17...PART BODY FILE: FARINI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00...NS/NA	40	.97	
01...SKU	322	7.84	7.92
02...BACK	400	9.74	9.84
03...CHEST	133	3.24	3.27
04...EYE	253	6.16	6.22
05...FINGER	531	12.94	13.06
06...FOOT	467	11.38	11.49
07...GENITAL	8	.19	.20
08...HAND	382	9.31	9.40
09...HEAD	290	7.06	7.13
10...LEG	544	13.25	13.38
11...NECK	45	1.10	1.11
12...SHOULDER	105	2.56	2.58
13...TOE	58	1.41	1.43
14...TRUNK	42	1.02	1.03
15...MULTIPLE	241	5.87	5.93
16...OTHER	244	5.94	6.00
TOTAL	4105	99.98	99.99

VARIABLE: 18...HOW OCCURD FILE: FARMWI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00... S/NA	67	1.63	
01...C'T IN	261	6.36	6.46
02...C'T BTWN	385	9.38	9.53
03...C'T UNDR	205	4.99	5.08
04...AGNST OB	688	16.76	17.04
05...FALL OBJ	195	4.75	4.83
06...FLY OBJ	171	4.17	4.23
07...SHARP OB	439	10.69	10.87
08...FOR OBJ	139	3.39	3.44
09...FALL SL	331	8.06	8.20
10...FALL DL	486	11.84	12.04
11...FALL UNK	18	.44	.45
12...ELEC CUR	8	.19	.20
13...FIRE/OBJ	44	1.07	1.09
14...HOT SUBS	17	.41	.42
15...CORROSIV	18	.44	.45
16...LIQUID	18	.44	.45
17...OVEREXRT	152	3.70	3.76
18...GAS/VAPR	10	.24	.25
19...WATR EXP	24	.58	.59
20...OTHER	429	10.45	10.62
TOTAL	4105	99.98	100.00

VARIABLE: 19...WHERE TRTD FILE: FARMWI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00... S/NA	832	20.27	
01...CLINIC	240	5.85	7.33
02...DOCT OFF	1467	35.74	44.82
03...HOME	175	4.26	5.35
04...HOSP ADM	286	6.97	8.74
05...HOSP EMR	909	22.14	27.77
06...NO TREAT	65	1.58	1.99
07...MULTIPLE	131	3.19	4.00
TOTAL	4105	100.00	100.00

VARIABLE: 20...TEMPERATUR FILE: FARINI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00...MISSING	922	22.46	
01...BELOW 1	31	.76	.97
02...1-32	356	8.67	11.18
03...33-50	758	18.47	23.81
04...51-85	1593	38.81	50.05
05...86-100	440	10.72	13.82
06...101/OVER	5	.12	.16
TOTAL	4105	100.01	99.99

VARIABLE: 21...PRECIPIT FILE: FARINI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00...MISSING	997	24.29	
01...CLEAR	2636	64.21	84.81
02...FOG	30	.73	.97
03...ICE	68	1.66	2.19
04...RAIN	142	3.46	4.57
05...SNOW	53	1.29	1.71
06...THUNDERSTORMS	118	2.87	3.80
07...OTHER	61	1.49	1.96
TOTAL	4105	100.00	100.01

VARIABLE: 22...WIND FILE: FARINI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00...MISSING	1081	26.33	
01...CALM	1653	40.27	54.66
02...BREEZE	1109	27.02	36.67
03...10-25MPH	228	5.55	7.54
04...26-40MPH	26	.63	.86
05...OVER 40	8	.19	.26
TOTAL	4105	99.99	99.99

VARIABLE: 23...SECURL LOC FILE: FARM1 DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00...MISSING	52	1.27	
01...BARN	596	14.52	14.71
02...FARMYARD	783	19.07	19.32
03...DRIVEWAY	210	5.12	5.18
04...YRD/GRDN	181	4.41	4.47
05...FRUIT BLDG	540	13.15	13.32
06...FIELD	821	20.00	20.26
07...HIGHWAY	46	1.12	1.13
08...HOUSE	123	3.00	3.03
09...LAND	328	7.99	8.09
10...LAGOON	0	.00	.00
11...POND/STRM	15	.37	.37
12...PUB AREA	39	.95	.96
13...ROAD	73	1.78	1.80
14...OTHER	298	7.26	7.35
TOTAL	4105	100.01	99.99

VARIABLE: 24...SURF COND FILE: FARM1 DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00...MISSING	878	21.39	
01...DRY	2262	55.10	70.19
02...ICY	147	3.58	4.56
03...MUDDY	175	4.29	5.45
04...STRAW/SC	196	4.82	6.14
05...OTHER	100	2.44	3.10
06...OIL/GRSY	15	.37	.45
07...SNOW	84	2.05	2.60
08...SLT	245	5.97	7.59
TOTAL	4105	100.01	100.08

VARIABLE: 25...SURF TYPE   FILE: FARWI   DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	PER CENT DISTRIBUTION EXCL ZERO
00...NS/NA	861	20.97	
01...ASPHALT	91	2.22	2.81
02...BRICK	1	.02	.03
03...CONCRETE	664	16.18	20.47
04...FLR COVR	68	1.66	2.10
05...METAL	98	2.39	3.02
06...SOIL	1632	39.76	50.31
07...VEGETATN	304	7.41	9.37
08...WOOD	205	4.99	6.32
09...OTHER	181	4.41	5.58
TOTAL	4105	100.01	100.01

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VARIABLE: 26...LIGHT COND   FILE: FARWI   DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	PER CENT DISTRIBUTION EXCL ZERO
00...NS/NA	838	20.41	
01...GD ARTFL	418	10.18	12.79
02...PR ARTFL	52	1.27	1.59
03...DAYLIGHT	2604	63.43	79.71
04...DARK	50	1.22	1.53
05...DWN/DSK	132	3.22	4.04
06...REDUCED	11	.27	.34
TOTAL	4105	100.00	100.00

VARIABLE: 27...THING INV FILE: FARMVI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00... NA	428	10.43	
01...AGR MACH	721	17.56	19.61
02...ANIMAL	694	16.91	18.87
03...PERSON	30	.73	.82
04...CHEMICAL	47	1.14	1.28
05...ELCTRCTY	22	.54	.60
06...FIREARMS	5	.07	.05
07...GAS/VAPR	12	.29	.33
08...HND TOOL	306	7.45	8.32
09...MSCLN IT	70	1.71	1.90
10...PWR TOOL	195	4.75	5.30
11...PRTS	5	.12	.14
12...TRACTOR	323	7.87	8.78
13...TRUCK	169	4.12	4.60
14...OTH VEH	419	10.18	11.37
15...OTHR	633	15.42	17.22
16...MISC ITM	29	.71	.79
TOTAL	4105	100.00	100.01

VARIABLE: 28...EXPOSURE FILE: FARMVI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00... NA	1130	27.53	
01...1/LESS	1861	45.33	62.53
02...1-4 HRS	724	17.73	24.47
03...5-8 HRS	291	7.09	9.78
04...8/OVER	95	2.31	3.19
TOTAL	4105	99.99	99.97

VARIABLE: 29...EXPERIENCE FILE: FARMI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00...[illegible]	1035	25.21	
01...<1 DAY	1500	36.54	48.86
02...1-7 DAYS	281	6.85	9.15
03...8-14	118	2.87	3.84
04...15-21	85	2.07	2.77
05...22-28	27	.66	.88
06...29-91	250	6.09	8.14
07...92-181	139	3.39	4.53
08...182 OR >	670	16.32	21.82
TOTAL	4105	100.00	99.99

VARIABLE: 30...PRIM.AG.OP FILE: FARMI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00...[illegible]	882	21.49	
01...BEEF	449	10.72	13.65
02...CORN	75	1.83	2.35
03...COTTON	35	.80	1.02
04...GRAIN	274	6.67	8.50
05...RICE	38	.93	1.19
06...SOYBEANS	36	.88	1.12
07...SGR CANE	3	.07	.09
08...TOBACCO	18	.44	.56
09...BEEF/HOG	101	2.46	3.15
10...FRUIT	158	3.85	4.90
11...TRK CROS	42	1.02	1.30
12...DAIRY	845	20.58	26.22
13...SEED CRP	47	1.14	1.46
14...OTHER	271	6.60	8.41
15...HOGS	53	1.29	1.64
16...POULTRY	44	1.07	1.37
17...CORN/BF	137	3.34	4.25
18...CORN/HOG	144	3.51	4.47
19...CORN/SOY	144	3.51	4.47
20...DAIRY/HG	68	2.14	2.73
21...SHEEP	21	.51	.65
22...NUTS	10	.24	.31
23...CUT FLWR	1	.02	.03
24...FLD FLWR	3	.07	.09
25...NURSERY	25	.61	.78
26...PLANTS	1	.02	.03
27...FLD CROP	171	4.17	5.31
TOTAL	4105	99.98	100.00

VARIABLE: 31...ACREAGE FILE: FARMNI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00...NA/NA	782	19.05	
01... 1- 49	221	5.38	6.65
02... 50- 99	185	4.51	5.57
03...100-199	474	11.55	14.26
04...200-499	1120	27.28	33.70
05...500-999	549	13.37	16.52
06...1000, >	481	11.72	14.47
07...UNKNOWN	293	7.14	8.82
TOTAL	4105	100.00	99.99

VARIABLE: 32...HLTH BEFOR FILE: FARMNI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00...NA/NA	1865	45.43	
01...GOOD	2133	51.96	95.22
02... US CARE	33	.80	1.47
03...MEDICATN	28	.68	1.25
04...ILL	3	.07	.13
05...MENTL HD	0	.00	.00
06...PHYSL HD	6	.15	.27
07...OTHER	15	.37	.67
08...UNKNOWN	22	.54	.98
TOTAL	4105	100.00	99.99

VARIABLE: 33...DAYS LOST FILE: FARMNI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00...NA/NA	1863	45.38	
01...<1 DAY	592	14.42	26.40
02...1-7 DAYS	996	24.26	44.42
03...8-14	212	5.16	9.46
04...15-21	89	2.17	3.97
05...22-28	33	.80	1.47
06...29-91	257	6.26	11.46
07...92-181	40	.97	1.78
08...182 OR >	23	.56	1.03
TOTAL	4105	99.98	99.99

VARIABLE: 34...HOSP DAYS FILE: FARMNI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00...IS/NA	1865	45.38	
01...<1 DAY	1371	45.58	83.45
02...1-7 DAYS	273	6.65	12.18
03...8-14	48	1.17	2.14
04...15-21	28	.68	1.25
05...22-28	9	.22	.40
06...29 OR >	13	.32	.58
TOTAL	4105	100.00	100.00

VARIABLE: 35...HOSP COST FILE: FARMNI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00...IS/NA	1063	45.38	
01...< $10	453	11.04	20.21
02...$10-50	902	21.97	40.23
03...$51-100	324	7.89	14.45
04...$101-500	308	7.50	13.74
05...$501-1K	76	1.85	3.39
06...$1K-2500	95	2.31	4.24
07...$2500-5K	45	1.10	2.01
08...> $5000	39	.95	1.74
TOTAL	4105	99.99	100.01

VARIABLE: 36...PROP.DAMG. FILE: FARMNI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00...IS/NA	1863	45.38	
01...< $1	2083	50.74	92.91
02...$1-100	92	2.24	4.10
03...$101-500	27	.66	1.20
04...$501-1K	13	.32	.58
05...> $1000	27	.66	1.20
TOTAL	4105	100.00	99.99

VARIABLE: 37...HELP DAYS FILE: FARMI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00...MISSING	1863	45.38	
01...<1 DAY	1930	47.02	86.09
02...1-7 DAYS	152	3.70	6.78
03...8-14	49	1.19	2.19
04...15-21	26	.63	1.16
05...22-28	7	.17	.31
06...29-91	69	1.68	3.08
07...92-181	4	.10	.18
08...182 OR >	5	.12	.22
TOTAL	4105	99.99	100.00

VARIABLE: 38...HELP COST FILE: FARMI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00...MISSING	1863	45.38	
01...< $1	1999	48.70	89.15
02...$1-100	109	2.66	4.86
03...$101-500	80	1.95	3.57
04...$501-1K	29	.71	1.29
05...> $1000	25	.61	1.12
TOTAL	4105	100.01	100.00

VARIABLE: 39...HLTH AFTER FILE: FARMI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00...MISSING	1932	47.06	
01...GOOD	1973	48.06	90.80
02...EMOTIONAL	1	.02	.05
03...PHYSICAL	63	1.53	2.90
04...OTHER	136	3.31	6.26
TOTAL	4105	99.99	100.01

VARIABLE: 40...REHAB REQD FILE: FARMNI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00...NA/NA	1913	46.60	
01...YES	33	.80	1.51
02...NO	636	15.49	29.01
03...UNKNOWN	1523	37.10	69.48
TOTAL	4105	99.99	100.00

VARIABLE: 41...BACK TO AG FILE: FARMNI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00...NA/NA	1915	46.65	
01...YES	445	10.84	20.32
02...NO/OTHER	33	.80	1.51
03...NO/UNABL	14	.34	.64
04...UNKNOWN	1698	41.36	77.53
TOTAL	4105	99.99	100.00

VARIABLE: 42...FS DATA FILE: FARMNI DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00...NA/NA	782	19.05	
01...FS YES	2242	54.62	67.47
02...FS NO	1081	26.33	32.53
TOTAL	4105	100.00	100.00

VARIABLE: 43...REGION FILE: FARMNT DATE: 11/30/87

VALUE	FREQUENCY	PER CENT DISTRIBUTION INCL ZERO	EXCL ZERO
00...[illegible]	0	.00	
01...REG 1	238	5.80	5.80
02...REG 2	394	9.60	9.60
03...REG 3	197	4.80	4.80
04...REG 4	223	5.43	5.43
05...REG 5	1125	27.41	27.41
06...REG 6	650	15.83	15.83
07...REG 7	239	5.82	5.82
08...REG 8	538	13.11	13.11
09...REG 9	501	12.20	12.20
TOTAL	4105	100.00	100.00