Appendix A: Survey Instrument

NATIONAL AGRICULTURAL STATISTICS SERVICE
U.S. Dept.of Agriculture
Rm 5809
Washington, D.C. 20250
202-720-7017

1995 AGRICULTURAL INJURY SURVEY

Form Approved
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Project Code 915

Dear Reporter:

We are conducting this survey for the Centers for Disease Control. The purpose of this survey is to learn the extent of farm and ranch injuries and accidents. The information will be used to develop injury prevention programs. Please mail your report, which will be kept confidential, in the enclosed envelope. Response to this survey is voluntary, and not required by law. Thank you for your cooperation.

Sincerely,

Richard D. Allen, Chairperson
Agricultural Statistics Board

Please make corrections in name, address and zip code, if necessary

Part I WORK-RELATED INJURIES

A WORK-RELATED INJURY is an injury associated with the business of operating your farm or ranch which resulted in ½ day or more of restricted activity. RESTRICTED ACTIVITY is defined as the inability to perform normal activities. A change in work performance as a result of an injury is also considered restricted activity. A DISABILITY is defined as full or partial loss of a body part or activity.

1. Did any farm work-related injuries occur in 1995?
   ☐ Yes - How many?.....Number 004
   ☐ No - Skip to question 18 on Page 3.

INCLUDE	EXCLUDE
Injuries which occurred while performing farm work on or off the farm.	Injuries which occurred during household and recreational activities.
Injuries to the operator, partners, paid and unpaid family members, full and part-time hired farm workers, and other unpaid farm workers.	Injuries to contractors, custom operators, special service workers, and farm visitors.

2. Did any injury result in a disability?
   ☐ Yes - How many?.....Number 020
   ☐ No

3. How many injuries (reported in question 1) involved a tractor as the major source of injury?. .....Number 005

THE FOLLOWING QUESTIONS REFER TO THE MOST RECENT INJURY REPORTED IN QUESTION 1.

4. Describe the most recent injury. include what the person was doing, what objects were involved, what sequence of events led to the injury, and where the event occurred.

CONTINUE ON NEXT PAGE

5. Relationship of the victim to the farm:

Operator or family (paid or unpaid)	1	007
Partner or family (paid or unpaid)	2	
Hired farm labor	3	
Non-family unpaid labor	4	
Other (specify)_____	5	

6. Sex of victim:

Male	1	008
Female	2	

7. Age of victim:

Less than 10	1	009
10 - 19	2	
20 - 29	3	
30 - 39	4	
40 - 49	5	
50 - 59	6	
60 - 69	7	
70 and older	8	

8. Race of victim:

White, Non-Hispanic	1	010
White, Hispanic	2	
Black	3	
Asian or Pacific Islander	4	
American Indian	5	
Other (specify) _____	6	

9. Month injury occurred:

January	1	011
February	2	
March	3	
April	4	
May	5	
June	6	
July	7	
August	8	
September	9	
October	10	
November	11	
December	12	

10. Severity of injury:

Restricted activity	1	012
Disability	2	
Fatality	3	

If disability or fatality, skip to question 13.

11. Was professional medical attention required?

Yes	1	013
No	2	

12. Number of days of restricted work activity.....Number 014

13. Part of body injured:

Head/neck	1	015
Eye	2	
Chest/trunk	3	
Back	4	
Arm/shoulder	5	
Finger	6	
Hand/wrist	7	
Leg/knee/hip	8	
Toe	9	
Foot	10	
Multiple body parts	11	
Other (specify)_____	12	

14. Nature of Injury

Amputation	1	016
Asphyxiation	2	
Bruise	3	
Burn	4	
Cut	5	
Crushed	6	
Fracture	7	
Poisoning	8	
Puncture	9	
Sprain/strain	10	
Drowning	11	
Electric Shock	12	
Multiple Injuries	13	
Other (specify)_____	14	

15. Type of injury event:

Caught part of body in object	1	017
Caught part of body between objects	2	
Caught part of body under objects	3	
Struck by or against object	4	
Struck by falling object	5	
Struck by flying object	6	
Contact with sharp object	7	
Fall to same level	8	
Fall from elevation	9	
Overexertion	10	
Contact with electricity	11	
Other (specify)_____	12	

16. Type of work being performed when injury occurred:

Farmstead maintenance or construction.	1	018
Machinery service or repair	2	
Field work (tillage, planting, harvesting)	3	
Storing or handling harvested crops	4	
Livestock handling	5	
Other (specify)_____	6	

17. Object or substance that caused the injury:

Tractor	1	019
Machinery	2	
Livestock	3	
Hand tool	4	
Power tool	5	
Pesticide/other chemical	6	
Plant/tree	7	
Working surface	8	
Truck/automobile	9	
Other vehicle	10	
Liquids (not chemicals)	11	
Other (specify) _____	12	

CONTINUE ON NEXT PAGE

Part II TRACTOR ACCIDENTS

18. Did any tractor accidents occur in 1995 (regardless of whether any injury occurred)?

Yes..... 1
No..... 2 105
If no, skip to question 26

THE FOLLOWING QUESTIONS REFER TO THE MOST RECENT TRACTOR ACCIDENT.

19. Did the tractor accident involve an overturn?

Yes..... 1
No..... 2 106
If no, skip to question 26

20. Did the tractor belong to this operation?

Yes..... 1
No..... 2 107

21. What was the result of the overturn?

Injury..... 1
Fatality..... 2 108
Individual unharmed..... 3

If the individual was unharmed, skip to question 23.

22. Who was the injured person?

Tractor operator..... 1
Passenger/extra rider..... 2 109
Other (specify)_____ 3

23. Was the tractor equipped with a Rollover Protective Structure (ROPS) or other rollover protection?

Yes..... 1 110
No..... 2

24. Was a seat belt being used?

Yes..... 1
No, but a seat belt was present..... 2 111
No seat belt was present..... 3

25. Describe the tractor overturn (unless it was described in question 2 on page1). Include what the person was doing, what objects were involved, what sequence of events led to the overturn, and where the event occurred.

Tractor overturns are the leading cause of accidental death on farms. In order to design programs to reduce the risk of tractor overturns, we need basic information about farm tractors.

26. How many farm tractors over 20 PTO horse power were used on this operation in 1995?.....Number 115
(If none, skip to question 27 on page 4)

Complete the table below regardless of whether any tractor accidents occurred.

	Tractors Used in 1995 Make and Model	Office use	Model Year (two digit	Rollover Protection (Enter code) 1=None 2=Rops 1/ 3=Cab(rollover protective design) 2/	Hours In Use On This Operation in 1995			
					Field	Road	Stationary	Total
1		021	022	023	024	025	026	027
2		028	029	030	031	032	033	034
3		035	036	037	038	039	040	041
4		042	043	044	045	046	047	048
5		049	050	051	052	053	054	055
6		056	057	058	059	060	061	062
7		063	064	065	066	067	068	069
8		070	071	072	073	074	075	076
9		077	078	079	080	081	082	083
10		084	085	086	087	088	089	090
11		091	092	093	094	095	096	097
12		098	099	100	101	102	103	104

1/ Roll-over protective structure. 2/ Include only if the cab is designed for roll-over protection. 3/ Plowing snow, scraping feed lots, etc...

CONTINUE ON NEXT PAGE

PART III - OPERATION CHARACTERISTICS

27. How many acres were in your operation in 1995 (include set aside acres)?.....Acres 001

The hours of work performed for your operation is needed to assess the risk of being injured while working for a farm or ranch. This estimate of risk will be compared to risk estimates for other industries.

28. Estimated total hours of farm work performed in 1995 by:
(Do not include hours worked by contractors, custom operators, or special service workers.)

The operator (paid or unpaid).....Hours	116
Operator's family (paid or unpaid).....Hours	117
Partner(s) (paid or unpaid).....Hours	118
Full-time hired workers.....Hours	119
Part-time hired workers.....Hours	120
Other unpaid workers.....Hours	121
Total Hours	002

29. Which part of your operation contributed the most to 1995 value of agricultural sales?

Cash grains (wheat, corn, soybeans, etc.)	1
Field crops (cotton, hay, tobacco, etc.)	2
Specialty crops (fruit, vegetables, etc.)	3
Horticultural specialties (flowers, nursery, etc.)	4
Livestock (cattle, hogs, etc.)	5
Dairy	6
Poultry and eggs	7
Animal specialities (horses, fur bearing animals, aquaculture, etc.)	8
Other (specify)_____	9
Conservation Reserve Program only	10

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30. Would you like a copy of the results of this survey?

Yes	1
No	2

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Public reporting burden for this survey averages 20 minutes per response. This includes the time for reviewing instructions, gathering the data, and completing the questionnaire. Send comments about this burden estimate or any other aspect of this survey, including suggestions for reducing the burden, to the Office of Management and Budget, Paperwork Reduction Project (0535-0223), Washington, DC, 20503. Please do not mail questionnaire to this address

Reported by _____ Date_____

Thank you for your assistance. Please return this survey form in the enclosed envelope.

Office use 114

Appendix B: Sample-based Estimators

1. Sampling Estimators and Variance Estimators for State Estimates

$$\bar{y}_i = \frac{\sum_{h=1}^{L} M_{ih}\,\bar{y}_{ih}}{M_i} = \textit{state mean of the variable of interest}$$

$$v(\bar{y}_i) = \frac{1}{M_i^2} \sum_{h=1}^{L} M_{ih}\,(M_{ih} - m_{ih})\,\frac{s_{ih}^2}{m_{ih}} = \textit{variance of } \bar{y}_i$$

where:

$$\bar{y}_{ih} = \sum_{j=1}^{m_{ih}} \frac{y_{ihj}}{m_{ih}} = \textbf{\textit{mean of stratum h in state i}}$$

$$s_{ih}^2 = \frac{\sum_{j=1}^{m_{ih}} (y_{ihj} - \bar{y}_{ih})^2}{m_{ih} - 1} = \textbf{\textit{variance of stratum h in state i}}$$

m_{ih} = ***number of farms sampled in stratum h in state i***

M_{ih} = *number of farms in stratum h in state i*

M_i = *number of farms in state i*

L = *number of strata in the state*

2. Unbiased Sampling Estimator and Variance Estimator for Regional Estimates

$$\bar{y}_{Reg} = \frac{N_{Reg}}{n_{Reg}\, M_{Reg}} \sum_{i=1}^{n_{Reg}} M_{Reg_i}\, \bar{y}_{Reg_i} = \textit{regional mean of the variable of interest}$$

where:

$$V(\bar{y}_{Reg}) = \frac{N_{Reg}^2}{n_{Reg}\, M_{Reg}^2}(1 - f_{Reg}) \frac{\sum_{i=1}^{n_{Reg}} M_{Reg_i}\left(\bar{y}_{Reg_i} - \bar{y}_{Reg}\right)^2}{n_{Reg} - 1} + \frac{N_{Reg}}{n_{Reg}\, M_{Reg}^2} \sum_{i=1}^{n_{Reg}} M_{Reg_i}^2\, v\,(\bar{y}_{Reg_i})$$

$= \textit{variance of } \bar{y}_{Reg}$

$\bar{y}_{Reg_i}$ = *second-stage mean for state i in region R*

$v\,(\bar{y}_{Reg_i})$ = *second-stage variance for state i in region R*

M_{Reg_i} = *number of farms in state i of region R*

M_{Reg} = *number of farms in region R*

n_{Reg} = *number of states sampled in region R*

N_{Reg} = *number of states in region R*

$f_{Reg} = \frac{N_{Reg} - n_{Reg}}{N_{Reg}}$ = *finite population correction (fpc) for region R*

3. Sampling Estimators and Variance Equations for National Estimates

$$\bar{y}_{Total} = \sum_{Reg=1}^{P} \frac{M_{Reg}}{M_{Total}} \bar{y}_{Reg}$$ = *national mean of the variable of interest*

$$V(\bar{y}_{Total}) = \sum_{Reg=1}^{P} \frac{M_{Reg}}{M_{Total}} V(\bar{y}_{Reg})$$ = *variance of* $\bar{y}_{Total}$

where:

P = *number of regional strata*

M_{Total} = *number of farms in the United States*

4. Estimators for the rate of injuries per hours worked.

A. State estimates:

$$R_i = \frac{\overline{y}_i}{\overline{x}_i} = \textit{ratio of mean for injuries divided by mean for hours in state } i$$

$$V(R_i) = (s_{\overline{y}_i})^2 + (R_i)^2 (s_{\overline{x}_i})^2 - 2\rho_i \, s_{\overline{y}_i} \, R_i \, s_{\overline{x}_i} = \textit{variance for } R_i$$

where:

$$\rho_i = \textit{correlation between injuries and hours in state } i$$

B. Regional estimates:

$$R_{Reg} = \frac{\overline{y}_{Reg}}{\overline{x}_{Reg}} = \textit{ratio of mean for injuries divided by mean for hours in a region}$$

$$V(R_{Reg}) = V(\overline{y}_{Reg}) + (R_{Reg})^2 V(\overline{x}_{Reg}) - 2\,COV(y_{Reg}, x_{Reg}) = \textit{variance of } R_{Reg}$$

where:

$$COV(y_{Reg}, x_{Reg}) = \frac{N_{Reg}^2}{n_{Reg} M_{Reg}^2}(1 - f_{Reg}) \frac{\sum_{i=1}^{n_{Reg}} M_{Reg_i} \left(\overline{y}_{Reg_i} - \overline{y}_{Reg}\right)\left(\overline{x}_{Reg_i} - \overline{x}_{Reg}\right)}{n_{Reg} - 1}$$

$$= \textit{covariance between } y_{Reg} \textit{ and } x_{Reg}$$

C. National Estimates:

$$R_{Total} = \frac{\bar{y}_{Total}}{\bar{x}_{Total}} = \textit{ratio of means for injuries divided by hours}$$

$$V(R_{Total}) = V(\bar{y}_{Total}) + (R_{Total})^2 V(\bar{x}_{Total}) - 2\,COV(y_{Total}, x_{Total})$$
$$= \textit{variance of } R_{Total}$$

where:

$$COV(y_{Total}, x_{Total}) = \sum_{Reg=1}^{P} \frac{M_{Reg}}{M_{Total}} COV(y_{Reg}, x_{Reg})$$

$$= \textit{covariance between } y_{Total} \textit{ and } x_{Total}$$

All equations are derived from chapters 5, 6, and 11 of "Sampling Techniques, 3rd Edition" by W.G. Cochran (John Wiley and Sons, 1977).