

Appendix A: Survey Instrument



NATIONAL
AGRICULTURAL
STATISTICS
SERVICE

U.S. Dept. of Agriculture
Rm 5809
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202-720-7017

1993 FARM 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 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

Richard D. Allen, Chairperson
Agricultural Statistics Board

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

1. How many acres were in your farm operation in 1993 (include set aside acres)? Acres
2. Estimated total hours of farm work performed by the operator, partners, and paid and unpaid family members during 1993. (Example: Two family members working 2 hours per day for 4 days a week for 30 weeks is 2 X 2 X 4 X 30 = 480 total hours.) Hours
3. Estimated total hours of farm work performed by full and part-time hired farm workers and other unpaid farm workers during 1993. Hours

An INJURY is any condition which resulted in 1/2 day or more of restricted activity. A WORK-RELATED INJURY is an injury associated with the business of operating your farm. RESTRICTED ACTIVITY is defined as the inability to perform normal activities.

INCLUDE

Injuries which occurred while performing farm work on or off the farm.

Injuries to the operator, partners, paid and unpaid family members, full and part-time hired farm workers, and other unpaid farm workers.

EXCLUDE

Injuries which occurred during household and recreational activities.

Injuries to contractors, custom operators, special service workers, and farm visitors.

4. How many farm work-related injuries occurred in 1993? Number
If no injuries occurred in 1993, skip to question 21 on page 3.
5. How many injuries (reported in question 4) involved a tractor as the major source of injury? Number

THE FOLLOWING QUESTIONS REFER TO THE MOST RECENT INJURY REPORTED IN QUESTION 4.

6. Describe the most recent injury. Include what the person was doing, what objects were involved, what sequence of events lead to the injury, and where the event occurred.

7. Relationship of the victim to the farm:

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

8. Sex of victim:

- Male 1
 - Female 2
- Enter code
008

9. Age of victim:

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

10. Race of victim:

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

11. Month injury occurred:

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

12. Severity of injury:

- Restricted activity 1
 - Disability (Full or partial loss of body part or activity) 2
 - Fatality 3
- Enter code
012

If disability or fatality, skip to question 15.

13. Was professional medical attention required?

- Yes 1
 - No 2
- Enter code
013

14. Number of days of restricted work activity:

014

15. Part of body injured:

- Head/neck 1
 - 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
- Enter code
015

16. Nature of injury:

- Amputation 1
 - 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
- Enter code
016

17. Type of injury:

- Caught part of body in object 1
- Caught part of body between objects 2
- Caught part of body under object 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 (slip or trip) 8
- Fall from elevation 9
- Overexertion 10
- Contact with electricity 11
- Other (specify) 12

Enter code
017

18. Type of work being performed when injury occurred:

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

Enter code
018

19. Object or substance which caused the injury:

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

Enter code
019

20. If more than one injury occurred, did any of the other injuries result in a disability (Full or partial loss of body part or activity)?

- Yes - How many? 020
- No

21. List all tractors over 20 horsepower used on your operation during 1993.

	Tractors Used In 1993 Make and Model	Office use	Model year	Rollover Protection (Enter Code) 1 = None 2 = ROPS1/ 3 = Cab (Rollover Protective Design)2/	Hours in Use On This Operation In 1993			
					Field	Road	Stationary	Other
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.

22. Did any tractor accidents occur in 1993 (regardless of whether any injury occurred)?

Yes 1 Enter code
 No 2

If no, skip to question 30.

THE FOLLOWING QUESTIONS REFER TO THE MOST RECENT TRACTOR ACCIDENT.

23. Did the tractor accident involve an overturn?

Yes 1 Enter code
 No 2

If no, skip to question 30.

24. Did the tractor belong to this operation?

Yes 1 Enter code
 No 2

25. What was the result of the overturn?

Injury 1 Enter code
 Fatality 2
 Individual unharmed 3

If the individual was unharmed, skip to question 28.

26. Who was the injured person?

Tractor operator 1 Enter code
 Passenger/extra rider 2
 Other (specify) 3

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

Yes 1 Enter code
 No 2

28. Was a seat belt being used?

Yes 1 Enter code
 No, but a seat belt was present 2
 No seat belt was present 3

29. Describe the tractor overturn (unless it was described in question 6 on page 1). Include what the person was doing, what objects were involved, what sequence of events lead to the overturn, and where the event occurred.

30. Which part of your agricultural operation contributed the most to your 1993 value of 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 Enter code
 Livestock (cattle, hogs, etc.) 5
 Dairy 6
 Poultry and eggs 7
 Animal specialties (horses, fur bearing animals, aquaculture, etc.) 8
 Other (specify) 9

31. Would you like to receive a copy of the results of this survey?

Yes 1 Enter code
 No 2

Public reporting burden for this survey averages 20 minutes per response. This includes 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, D.C. 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

Appendix B: Sample-based Estimators

1. Sampling Estimators and Variance Estimators for State Estimates

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

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

where:

$$\bar{Y}_{ih} = \sum_{j=1}^{m_{ih}} \frac{Y_{ihj}}{m_{ih}} = \text{mean of stratum } h \text{ in state } i$$

$$s_{ih}^2 = \frac{\sum_{j=1}^{m_{ih}} (Y_{ihj} - \bar{Y}_{ih})^2}{m_{ih} - 1} = \text{variance of stratum } h \text{ in state } i$$

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

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

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

= variance of \bar{Y}_{Reg}

where:

\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

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

3. Sampling Estimators and Variance Equations for National Estimates

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

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

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:

$$R_i = \frac{\bar{Y}_i}{\bar{X}_i} = \text{ratio of mean for injuries divided by mean for hours in state } i$$

$$V(R_i) = (s_{\bar{Y}_i})^2 + (R_i)^2 (s_{\bar{X}_i})^2 - 2\rho_i s_{\bar{Y}_i} R_i s_{\bar{X}_i} = \text{variance for } R_i$$

where:

ρ_i = correlation between injuries and hours in state i

B. Regional estimates:

$$R_{Reg} = \frac{\bar{Y}_{Reg}}{\bar{X}_{Reg}} = \text{ratio of mean for injuries divided by mean for hours in a region}$$

$$V(R_{Reg}) = V(\bar{Y}_{Reg}) + (R_{Reg})^2 V(\bar{X}_{Reg}) - 2 \text{COV}(\bar{Y}_{Reg}, \bar{X}_{Reg})$$

= variance of R_{Reg}

where:

$$\text{COV}(\bar{Y}_{Reg}, \bar{X}_{Reg}) = \frac{N_{Reg}^2}{n_{Reg} M_{Reg}^2} (1 - f_{Reg}) \frac{\sum_{i=1}^{n_{Reg}} M_{Reg,i} (\bar{Y}_{Reg,i} - \bar{Y}_{Reg})(\bar{X}_{Reg,i} - \bar{X}_{Reg})}{n_{Reg} - 1}$$

= covariance between \bar{y}_{Reg} and \bar{x}_{Reg}

C. National Estimates:

$$R_{Total} = \frac{\bar{Y}_{Total}}{\bar{X}_{Total}} = \text{ratio of means for injuries divided by hours}$$

$$\begin{aligned} V(R_{Total}) &= V(\bar{Y}_{Total}) + (R_{Total})^2 V(\bar{X}_{Total}) - 2 COV(Y_{Total} , X_{Total}) \\ &= \text{variance of } R_{Total} \end{aligned}$$

where:

$$\begin{aligned} COV(Y_{Total} , X_{Total}) &= \sum_{Reg = 1}^P \frac{M_{Reg}}{M_{Total}} COV(Y_{Reg} , X_{Reg}) \\ &= \text{covariance between } Y_{Total} \text{ and } X_{Total} \end{aligned}$$

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

