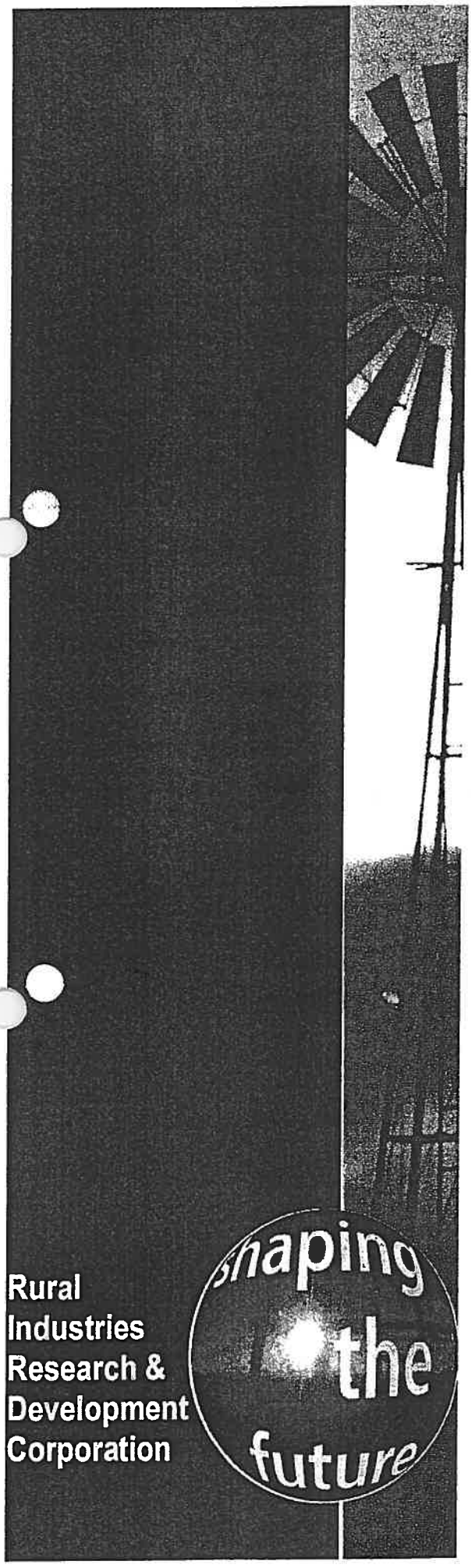

RURAL INDUSTRIES RESEARCH
& DEVELOPMENT CORPORATION

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Research in Progress as at June 2003

Sub-Program 4.3

FARM HEALTH & SAFETY PROGRAM

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"RIRDC Completed Projects in 2002-2003 and Research in Progress as at June 2003 - 4.3 Human Capital, Communications & Information Systems"
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Foreword

This year RIRDC has produced *Research in Progress, June 2003,* which contains short summaries of continuing projects as well as those that were completed during 2002-2003 for all of the Corporation's 20 program areas.

The complete report on all the programs is only available in electronic format on our website at http://www.rirdc.gov.au

The following report is a hardcopy extract covering Sub-Program 4.3. It contains all entries from continuing and completed Human Capital, Communications and Information Systems research projects funded by RIRDC in 2001-2002. This program aims to enhance human capital and facilitate innovation in rural industries and communities.

This report is the newest addition to our extensive catalogue of over 900 research reports, videos and CD-Roms of projects supported by RIRDC. Please contact us for the latest publications catalogue or view it on our website:

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Simon Hearn
Managing Director
Rural Industries Research and Development Corporation

Human Capital, Communications & Information Systems
COMPLETED PROJECTS

Farm Health and Safety:

PROJECT No	PROJECT TITLE	RESEARCHER	PHONE	ORGANISATION	PAGE No
FAI-1A	4th National Farm Injury Prevention Conference	Mr. Richard Franklin	(02) 6752 8215	The University of Sydney	1
GAP-1A	Farm machinery safety regulatory review project	Prof. Neil Gunningham	(02) 6249 3397	Gunningham & Associates Pty Ltd	2
UMO-22A	Evaluation of farm injury prevention in Victoria 1998-2001	Dr. Lesley Day	(03) 9905 1811	Monash University	3
UMO-29A	Preliminary safety tractor access platform evaluation	Dr. Lesley Day	(03) 9905 1811	Monash University	4
US-111A	Preliminary stage of noise injury prevention in the farming community	Mr. Richard Franklin	(02) 6752 8215	The University of Sydney	5
US-86A	National farm injury data collection - Australian centre for agricultural health & safety	A/Prof. Lyn Fragar	(02) 6752 8210	The University of Sydney	6
US-87A	National farm machinery safety program - Australian Centre for Agricultural Health & Safety	A/Prof. Lyn Fragar	(02) 6752 8210	The University of Sydney	9
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Human Capital, Communications & Information Systems
RESEARCH IN PROGRESS 2002-2003

Farm Health and Safety

PROJECT No	PROJECT TITLE	RESEARCHER	PHONE	ORGANISATION	PAGE No
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QUT-5A	Organophosphate exposure in agricultural workers: human exposure and risk assessment.	A/Prof. Michael Capra	(07) 3964 5804	Queensland University of Technology	14

COMPETED PROJECTS
Farm Health and Safety

Project Title: 4th National Farm Injury Prevention Conference

RIRDC Project No.: FAI-1A
Researcher: Richard Franklin
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Objectives

- To catalogue farm health and safety activities undertaken in the last five years by, Work Health Authorities, Divisions of General Practice and University Departments of Rural Health

Background

The health status of male farmers in Australia especially injury related is worse than their urban peers. Non-intentional injury on Australian farms results in around 150 deaths, 6,500 hospital admissions, and 6,000 workers compensation claims each year. In addition, there are between 20 and 70 presentations to hospital emergency departments for farm injury per 100 farms. The current cost of farm injury in Australia is thought to be between $0.5 and $1.29 billion per annum. A contributing factor to farms, as a workplace and a home, is that injury is attributed to all ages. In particular, children and older adults are at risk of injury on farms.
Injury Prevention 2001 offers a wonderful opportunity for researchers, policy makers, practitioners, industry, and farmers with a particular interest in rural injury to come together. Injury Prevention 2001 provides an opportunity for RIRDC, as a major stakeholder in injury prevention in the agriculture the opportunity to strengthen and develop its identity in the rural workplace health and safety sector.

Research

All Work Health Authorities, Rural Divisions of General Practice, and University Department of Rural Health were survey for farm health and safety activities over the last five years. This information was then catalogued according to themes from the responses.

Outcomes

Information about the activities of the Work Health Authorities, Rural Division of General Practice and University Departments of Rural Health were catalogued and presented at the 4th National Farm Injury Prevention Conference.

Implications

This project has shown that there is an extensive amount of work being undertaken in Australia in the area of Farm Health and Safety.

Project Title:	Farm machinery safety regulatory review project

RIRDC Project No:	GAP-1A
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Objectives

As part of the Farmsafe Australia National Farm Machinery Safety Strategy, to:

1. Identify and distinguish between national, state and territory legislation/regulations/standards, which relate to farm machinery design, farm machinery safety codes/designs and safe work practices.
2. Review the effectiveness and appropriateness of legislation and standards in improving farm machinery safety, including issues of national uniformity and interpretation.
3. Examine the relationship between legislation, standards and codes of practice.
4. Assess the relative efficiency and effectiveness of specification, performance and process/systems based standards.

Recommend the optimal mix of different types of standards in the context of improving machinery safety.

Background

Farm machinery related injury has been shown to result in high numbers of deaths on farms and high costs to agriculture in Australia. One of the most effective ways of minimising farm machinery accidents is through regulation of machinery design, manufacture, supply and operation. However, existing farm machinery regulation in Australia is seriously deficient in a number of respects, and the Australian Agricultural Health Unit has identified regulatory reform as a high priority.

Research

This project both identifies the major deficiencies of the existing legislation and standards, and makes recommendations for a best practice regulatory regime. Its overall aim is to identify a strategy to reduce the very high rates of accident and injury in the agricultural sector, in particular, the substantial proportion that is associated with farm machinery.

Outcomes

The Report argues that in many respects the law can make a substantial contribution to improving OHS providing it is appropriately designed, complemented by appropriate education and training, and effectively implemented.

Implications

The Report endorses the use of performance standards supported by codes of practice and guidance notes, because of the greater flexibility this approach provides in most circumstances and because a stricter specifications standards approach would be both impractical and inhibit safety innovation. In terms of enforcement, a mixed approach is recommended, with advice and persuasion being the preferred strategy but escalating to the use of administrative notices, on the spot fines and ultimately, prosecution in extreme cases to give credibility to the overall 'enforcement pyramid'. More specific solutions are identified in relation to child safety, changing technology and remoteness of farms. Beyond all else the virtues of pursuing an optimal policy mix are emphasised. For while education, training and information play crucial roles, so too, should positive incentives, and, in extreme cases, prosecution.

Project Title:	Evaluation of farm injury prevention in Victoria 1998-2001

RIRDC Project No:	UMO-22A
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Objectives

- To compare the impact of differing approaches to farm injury prevention in Victoria and Queensland.

Background

Monitoring and evaluation of farm health and safety programs is important for improving health outcomes for farmers, farm workers and their families. This project was undertaken to monitor changes to farm safety practices and behaviour, and injury rates, in Victoria to support state-wide and regional programs. As similar monitoring has also been occurring in Queensland, results were compared between the two

Research

Prevention activities were documented by discussion with the key stakeholders, participant observation of Farmsafe meetings, and referral to documents and reports for each state. Random cross-sectional postal surveys of Victorian farmers were conducted in 1998 (1,223 respondents) and 2001 (1,382 respondents). The questionnaire, developed collaboratively with Keith Ferguson (Dept Industrial Relations, QLD), covered work related injury and illness in the previous 12 months, tractor safety features, farm safety training, farm safety practices, hours worked, purchase of farm safety items, child safety and demographic characteristics. Comparisons were made between the two time points in VIC, between the four major commodity groups at the two time points, and between VIC & QLD for 1998. Comparisons were also made between those who had and had not been exposed to various farm safety activities and programs.

Outcomes

The key organisations involved in farm safety, and the major farm safety strategies, were similar in both states. The use legislation in QLD to create an environment for change, was somewhat different to VIC where legislation actually required change and was coupled with enforcement. Implementation in VIC has tended to focus on single key issues while in QLD, a broader focus has been taken.

There were relatively small improvements in some farm safety factors in VIC over the three year period. These were coupled with 14% reduction in the serious injury rate from 8.5 to 7.3 per 100,000 hours worked. A range of factors were associated with taking at least one safety related action, over the previous 12 months, and with at least average farm safety behaviour performance. Among the four major commodity groups in VIC, the milk cattle group showed statistically significant improvements across the largest number of variables measured. Rates of serious injury per 100,000 hours worked decreased by 5% and 4% for milk and meat cattle respectively, and by 1% for cereal grains.

QLD and VIC farms differed on various farm safety factors, each having stronger performance on different factors, some of which could not be explained by the different commodity mix in the two states. The serious work-related injury rate per 100,000 hours worked for all farms was significantly higher in Victoria (8.5) than in Queensland (3.1). This difference was also apparent across the four major commodity groups.

Implications

A number of methodological issues were identified which require addressing to improve future monitoring of the uptake of farm safety practices and injury rates. Recommendations for farm safety programs in VIC were made, which if implemented, should improve efficiency and effectiveness. Some of these are already being considered by the Victorian WorkCover Authority.

Publications

Day, L., and Ferguson, K. (1999). A tale of two states: farm injury prevention in Queensland and Victoria. Paper. Third Biennial National Farm Injury Prevention Conference, Cairns.

Day L. and Stathakis V. (June 2002). Evaluation of farm injury prevention in Victoria. Canberra: Rural Industries Research and Development Corporation.

Project Title:	Preliminary safety tractor access platform evaluation

RIRDC Project No:	UMO-29A
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Objectives

- To explore the benefits & disbenefits of retro-fitted safe tractor access platforms; To compare the design features of the retro-fitted platforms with access on new tractors

Background

Tractor run-over events are a leading cause of adult work-related injury on farms. Farm safety action groups in Victoria have retro-fitted tractors with safe access platforms designed to reduce run-over deaths & serious injury. The groups used guidance material produced by a reputable agency. We undertook an evaluation of this initiative, focussing on the operational and design aspects.

Research

Qualitative methods and engineering-based inspections were used to (1) gather information from 10 farmers regarding benefits and disbenefits of fitment and (2) assess the construction and fitment of the platforms. An estimation was made of the percentage reduction in potential damage achieved for each tractor. The average total cost per tractor was derived. Inspections were also conducted for comparison on 7 new tractors.

Outcomes

The initial implementation of this initiative was relatively successful. The safety of access had unquestionably been improved. The platforms generally met the design specifications although adherence to two key features relating to the positioning of the outer edge of the bottom step, and guarding of the rear wheel was poor on some of the tractors. The estimated reduction in potential damage ranged from 30-40% to 90-95%. There was little evidence to suggest increased passenger carriage may occur as a result of the retro-fitted platforms. The platforms had little impact on tractor operations, but had a significant impact on ease of access. The average cost to the farmer was between $310 and $446. The retro-fitted tractors performed at about the same level or better than the new tractors on most access features.

Implications

This initiative has the potential to significantly reduce tractor run-over deaths and injury, in addition to physical work demand associated with getting on & off tractors. Platform retro-fitment could be considered to be current best practice in the management of tractor run-over risk. Further implementation should include mechanisms to increase adherence to key design features. Recommendations are made regarding promotion, review of currently available non-slip materials, involvement of skilled engineers, critical characteristics of platforms, precautions for passenger carriage, the need to address other aspects of run-over prevention, and safe access on new tractors.

Publications

Day L and Rechnitzer G. Evaluation of the safe tractor access platform. Canberra: Rural Industries Research and Development Corporation.

Project Title:	Preliminary stage of noise injury prevention in the farming community

RIRDC Project No: US-111A
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Objectives

- To move the NSW hearing conservation program from NSW into the rest of Australia through the development of a national strategy.
- To gather information about the current noise levels on farms.
- To develop resources that enable farmers to better manage their hearing health.
- To examine the current hearing status of young farmers.

Background

Farmsafe Australia (FSA) has as goal 4, "Reduction in the number of young people on farms (aged 15-24 years) with noise induced hearing loss". In the review of FSA goals and targets the only state that had progressed towards this goal was NSW, having run hearing screenings at major field days and provided noise reduction strategies to 6,000 farmers since the program began. Much of the current information being used for information for farmers is over 25 years old having been carried out in the mid 70's. Also to progress the noise injury reduction in Australian agriculture, has been hampered due to differences in health infrastructure from state to state.

Research

This study undertook to examine noise emissions form different machinery and tools that used in agriculture via collection noise levels from a range of different farm producing different agricultural commodities. There were 48 farms across a range of producer groups, with noise levels recorded at the ear of the operators and any others in close proximity to noisy activities on farm. The average and peak noise levels were recorded for 56 types of machinery / activity sites on farm, totalling 298 separate items/activities.
An analysis of information collected from 808 farmers and farm workers aged 15-24 years who had presented at a field day in NSW was examined. A reference group from individual working in agriculture, audiometry, and health and safety were established to produce a strategy for the prevention of noise injury on farms.

Outcomes

There were 48 farms across a range of producer groups, with noise levels recorded at the ear of the operators and any others in close proximity to noisy activities on farm. The average and peak noise levels were recorded for 56 types of machinery / activity sites on farm, totalling 298 separate items/activities. A report establishing baseline hearing screening results and exposure information was produced. This report clearly shows that even at young ages, people working on farms are displaying signs of noise injury. A strategy that has been adopted by Farmsafe Australia was produced and is available in an electronic format.

Implications

Noise injury is a significant problem in the farming community and if strategies to reduce the exposure to noise are not implemented immediately there will continue to be a significant number of farmers who by age 40 will have problems hearing and in their 50's will need hearing aid to hear. We are also seeing those working on farms as young as 15 showing signs of noise injury. To combat this problem the farming community needs to establish strategies to restrict noise exposure to all people on farms.

Publications

Depczynski J, Franklin RC, Chalinor K, Williams W, Fragar LJ (2002). *Farm Noise Hazards: noise emissions during common agricultural activities.* ACAHS & RIRDC: Moree
Franklin RC, Challinor K, Depczynski J, Fragar LJ (2002). *Noise Exposure, Hearing Protection and Noise Injury in Young Adult Farmers.* ACAHS & RIRDC: Moree
FSA (2002). *Noise Injury Prevention Strategy for the Australian Farming Community.* Farmsafe Australia:
Noise Emission Fact Sheet

Project Title:	National farm injury data collection - Australian centre for agricultural health & safety

RIRDC Project No: US-86A
Researcher: A/Prof. Lyn Fragar
Organisation: The University of Sydney, Australian Centre for Agricultural Health and Safety
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Objectives

1. To provide relevant data reports for the national farm health and safety programs:
   - Maintaining data collection standards and definitions for farm health and safety injury and illness
   - Farm machinery safety data reports
   - Commodity specific data for OHS programs
   - State Farmsafe network programs
   - Divisions of General Practice and other related farm worker health and safety programs
   - National injury prevention programs addressing falls
   - Evaluation of programs – adoption and impact on improving health and safety
2. To develop a standardised methodology for costs/benefit studies in farm OHS.
3. To develop and deliver training in farm OHS data collection and evaluation of farm OHS programs.

Background

A growing number of agricultural industries and related agencies had taken up the challenge of reducing on-farm injury and illness, reducing workers compensation costs, reducing cost associated with litigation and prosecution, improving injury care and rehabilitation management, coordinated through the Farmsafe Australia partnership. Critical to the development and dissemination of solutions to the agricultural sector, has been the provision of timely and reliable data.

This project has built on the previously RIRDC funded Farm Injury Data Centre Project which has been highly successful in providing the underpinning data for development of the priority Farmsafe Australia programs and other programs aimed at reducing farm injury and death.

Farm injury surveillance is an emerging specialty discipline within the injury prevention and OHS fields of endeavour. This project was to see the farm injury data reports extend knowledge in the field with revision of the Farm Injury Optimum Data Set and with the development of methodologies for cost/benefit studies in farm OHS, and in delivery of training in farm injury data collection and management to a wider network of agencies.

Research

The National Farm Injury Data Centre Manager was maintained by the Australian Centre for Agricultural Health and Safety with a key role to supervise the production of reports and outputs defined by the Project. Project personnel worked closely with the national network of data managers – in state work health authorities, with the Australian Institute of Health and Welfare (AIHW) and the Flinders Injury Studies Centre, with the National Occupational Health and Safety Commission, with state Health departments, with individual researchers and others. The National Farm Injury Data Collection was maintained and used to produce reports that underpinned the national farm safety programs. Data sources include deaths data of the Australian Bureau of Statistics, Hospital data, workers compensation derived data, research data and coronial data.

Outcomes

The following reports were produced in association with the Rural Industries Research and Development Corporation:

- Fragar LJ, Franklin RC (2000). *The health and safety of Australia's farming community.* ACAHS & RIRDC: Moree
- Fragar L, Franklin R, Coleman R (2000). *The farm injury optimal dataset. Version 1.2.* ACAHS & RIRDC: Moree

- Franklin R, Chater AB, Fragar L, Ferguson K (2000). *Rural injury in Central Queensland: Injury data from eleven Emergency Departments and nine General Practice surgeries, 1995-1996.* ACAHS & RIRDC: Moree
- Franklin RC, Fragar LJ, Houlahan J, Brown P & Burcham J. (2001) Health and Safety Risks Associated with Cotton Production. Version 1.2. ACAHS & RIRDC: Moree.
- Franklin R, Mitchell R, Driscoll T, Fragar L (2000). *Farm-Related fatalities in Australia, 1989-1992.* ACAHS, NOHSC & RIRDC
- Fragar LJ, Franklin RC, Lower A (2001). *Occupational Health and Safety Risk Associated with Sheep and Wool Production in Australia.* ACAHS & RIRDC: Moree
- Franklin RC, Brown P, Fragar LJ, Houlahan JB (2001). *Occupational Health and Safety Risk Associated with Horticulture Produce Production.* ACAHS & RIRDC: Moree
- Franklin RC, Fragar LJ, Houlahan J, Brown P, Burcham J (2001). *Health and Safety Risks Associated with Cotton Production. Version 1.2.* ACAHS &RIRDC: Moree
- Fragar LJ, Franklin RC, Allen C, Harding W (2001). *Occupational Health and Safety Risks Associated with Sugarcane Production.* ACAHS & RIRDC: Moree
- Fragar LJ. *Mapping of the National Competency Standards (1998) to the Managing Farm Safety course learning outcomes.* February 2001. Australian Centre for Agricultural Health and Safety. Moree
- Franklin R, Fragar L. *The health and safety of Western Australian farmers, farm workers and farm families.* National Farm Injury Data Centre, ACAHS and RIRDC. 2002. Moree
- Hewitt RJ, Franklin RC, Fragar LJ. (2002). *Guidelines for undertaking benefit–cost studies in farm health and safety, Manual & Case Study.* RIRDC & ACAHS: Moree
- Franklin RC, Fragar LJ, Houlahan J. *Health and safety risks associated with beef cattle production.* Moree: Australian Centre for Agricultural Health and Safety with the Rural Industries Research and Development Corporation; 2002. (In draft).
- Franklin R, Fragar L, Thomas P. *Falls in agriculture*: Australian Centre for Agricultural Health and Safety with the Rural Industries Research and Development Corporation 2003. (Draft).
- Fragar LJ, Thomas P, Houlahan J. *Health and safety risks associated with grains production.* Moree: Australian Centre for Agricultural Health and Safety with the Rural Industries Research and Development Corporation; 2002. (In draft).
- Fragar LJ, Thomas P, Houlahan J. *Health and safety risks associated with dairy production.* Moree: Australian Centre for Agricultural Health and Safety with the Rural Industries Research and Development Corporation; 2002. (In draft).

Implications

An external evaluation of the project and of the National Farm Injury Data Centre of the Australian Centre for Agricultural Health and Safety was undertaken by Dr Timothy Driscoll as part of the project that evaluation concluded :

"The Review has found that the NFIDC has met nearly all of the objectives set by the Joint Venture, within the constraints placed by the available funding and the available data. Since its inception, the NFIDC has provided the information that has been the basis for virtually all planning and activity at the national level in farm-related occupational health and safety. This information has made a major contribution to government and industry policy and programming leading to activities aimed at minimising the risks and consequences of farm-related injury. The perceived lack of timeliness of data used by the NFIDC has only moderate impact on the suitability of the data for prevention purposes. On-going information from sources such as workers' compensation and hospital in-patient statistics is of use for on-going surveillance purposes, but work is required to better understand the representativeness and coverage of this information. Support and development of new data sources is also required to increase the coverage and quality of surveillance information relevant to farm injury.

The level of involvement of the agriculture industry in guiding the work of the NFIDC, and adopting the OHS products that arise directly and indirectly from the NFIDC activities, is unprecedented in industry in Australia (although mining also has a sophisticated system) and internationally. The NFIDC has significantly enhanced the research efforts of others involved in farm injury prevention through active and passive support of research projects. Through this activity, the NFIDC probably has contributed

to the improvement of productivity of Australian agriculture, but the extent of this contribution is not known.

The Review identified some new activities which could usefully be undertaken by the NFIDC, or which should be considered for future activity. These include the feasibility of using news clipping as a source of on-going data; the collection of quantitative data on exposure to hazards, and the use of representative sample data.

Publications

The following were published in the peer reviewed literature

- Franklin RC, Fragar LJ, Page AN (2000). The national farm injury data collection: data to inform farm injury prevention programs. *Australian Epidemiologist 7(1)* 18-24.
- Franklin R, Fragar L, Page A (2000) Utilising farm injury data in the development of hazard and risk profiles for farming commodity groups. *Readings in Injury Prevention and Control: Proceedings of the Third National Conference on Injury Prevention and Control. 9-12 May 1999 Brisbane, Queensland, Australia.* University of Queensland. 162-163
- Lower T, Fragar L, Temperley J. (2000) Improving health and safety in the Australian sheep industry. J Occup Health Safety – Aust NZ 2000, 16(2):117-125
- Fragar L, Page AN, Gray L, Franklin RC (2000) Child safety on farms: a framework for a national strategy in Australia. *Readings in Injury Prevention and Control: Proceedings of the Third National Conference on Injury Prevention and Control. 9-12 May 1999 Brisbane, Queensland, Australia.* University of Queensland. 164-167
- Page A, Fragar L (2001). Recall of Farm Hazards in Australian Primary School Age Children Using A 3-D Visual Cue Test. *Australian Journal of Rural Health* 9(5): 216-221
- Franklin RC, Mitchell RJ, Driscoll TR, Fragar LJ (2001a). Agricultural Work–Related Fatalities in Australia, 1989–1992. *Journal of Agricultural Health and Safety.* 7(4):213-227
- Franklin RC, Mitchel RJ, Driscol TR, Fragar LJ (2001b). Non–Work–Related Farm Fatalities in Australia, 1989–1992. *Journal of Agricultural Health and Safety.* 7(4):229-239
- Mitchell RJ, Franklin RC, Driscoll TR, Fragar LJ (2001). Farm-related fatalities involving children in Australia, 1989-1992. *Australian & New Zealand Journal of Public Health,* 25: 155-166
- Fragar L (2001). The health of the people in agriculture and its interdependence with the health of rural communities. *NSW Public Health Bulletin* 12 (6): 155-159
- Page AN, Fragar LJ. Suicide in Australian Farming, 1988-1997. *ANZ J Psychiatry* 2002;36:
- Fragar L, Houlahan JB. Injury Prevention approaches in Australian agriculture. *NSW Public Health Bulletin.* 2002; Jun
- Mitchell RJ, Franklin RC, Driscoll TR, Fragar LJ. Farm-related fatal injury of young and older adults in Australia, 1989-1992. *Aust J Rural Health* 2002; 10, 209-219
- Franklin R, Crosby J. Farm Related Injury in NSW: Information for Prevention. *NSW Public Health Bulletin* 2002, 13, 5.
- Fraser J, Alexander C, Simpkins B, Temperley J. Health Career Promotion in the New England Area of New South Wales: A Program to Support High School Career Advisers. *Aust J Rural Health.* In Press.

Project Title:	National farm machinery safety program - Australian Centre for Agricultural Health & Safety

RIRDC Project No: US-87A
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Objectives

Implementation of the Farmsafe Australia National Farm Machinery Strategy, and specifically:

1. Establishment of the national framework for action through maintenance of the National Farm Machinery Safety Reference Group to oversee the program
2. Identification of farm machinery safety priorities for action (with the National Farm Injury Data Centre Project)
3. Recommendations for safe working practice, safer machine design, modifications of current standards, further research action for 4 key problems, being
   - Tractor run-overs
   - Grain augers
   - Post-hole diggers
   - PTO shaft guards
4. Development of education and training resources for farm machinery safety
5. A review of relevant national, state and territory legislation/regulations/standards and their implementation (To be undertaken by the Farm Machinery Safety Regulatory Review Project)
6. A media and promotion strategy aimed at ensuring participation of all stakeholders

Background

Each year 36 deaths occur as a result of farm machinery injury, and more than 500 people are admitted to hospital for severe injury. The annual fatality rate for farm machinery operators is 241/100000 persons. It is estimated that farm machinery injury represents more than half of the $.5b-$1.2b estimated cost of occupational injury and illness in Australian agriculture per annum.

Farmsafe Australia had established the National Farm Machinery Safety Reference Group (NFMS Reference Group) with representation from across the rural industry to address this problem. The NFMS Reference Group is comprised of representatives from industry, occupational health and safety, injury research centres, producers and manufacturers.

A necessary first step was to define the key farm machinery hazards and risk factors to be addressed by designers, manufacturers, trainers, suppliers, farm managers and operators. This process has begun through the efforts of Farmsafe Australia and the Australian Centre for Agricultural Health and Safety that provided 6 months Research Officer time to Farmsafe Australia to prepare an Issues Paper and to develop its strategic approach. It was agreed that a program that addressed a selected small group of key machinery injury hazards be initiated as part of a wider approach to reducing machinery injury.

Research

Progress in implementation of the National Farm Machinery Strategy was made in the following areas:

1. *Establish a national framework for action*

The NFM Reference Group endorsed the National Strategy and a program of work was undertaken. The Reference Group will meet to consider key recommendations in August 2003.

2. *Define the farm machinery injuries problem and identify priorities for action*;

The National Farm Machinery Reference Group met and auspiced a program of research that has reported on the following:

- Injury associated with posthole diggers
- Injury associated with tractor runover
- Injury associated with grain augers
- Materials used for PTO shaft guards

3. *Strategies to address selected key problems;*

The reduction of tractor rollover deaths in Australia has been significantly advanced in Victoria and NSW through industry and government programs aimed at retrofitment of ROPS to tractors, and a mix of subsidy for retrofitment, and enforcement of legislation requiring ROPS.

Other strategies that have been recommended include development of guidelines for safe operation, training and recommendations for improved safety design of machinery and equipment in use on Australian farms..

Strategies for promotion of machinery safety have to be developed.

4. *Education and Training;*

Machinery safety is included in the *Managing Farm Safety* training programs of Farmsafe Australia

5. *Standards and legislation*

A paper was produced by Neil Gunningham that reviewed farm machinery safety regulatory arrangements across Australia with input by the FMS Reference Group. The Reference Group will consider its response to specific recommendations aimed at improving the contribution that regulation can make on safe operation of farm machinery.

6. *Research;*

Studies relating to posthole diggers, tractor runover, augers and PTO guard materials were undertaken by the Australian Centre for Agricultural Health and Safety at Moree and the University of Queensland at Gatton.

In addition, a research program of the Monash University Accident Research Centre has been incorporated into the national program.

Outcomes

Reports are in process of being considered by the NFM Reference Group, and recommendations that relate to draft Guidance Notes, improved design and training requirements will be promulgated. Recommendations for further research will be made to RIRDC and the Joint Venture

Implications

Work to date has confirmed farm plant and machinery (mobile and fixed) as key hazards associated with injury and death in Australia. The project has progressed the issue to the degree that 4 specific hazards have been examined and the National Farm Machinery Reference Group can proceed with a better informed strategic approach to its program of work in reducing machinery injury on Australia farms.

Publications

Draft reports are available, and will be published following consideration by the National Farm Machinery Reference Group:

Miller J, Fragar L, Franklin R. *Accidents involving posthole diggers*. Australian Centre for Agricultural Health and Safety and Rural Industries Research and Development Corporation. 2003.

Athanasiov A, Gupta ML, Fragar LJ. *An Analysis of Grain Auger-related Injuries in Queensland.* (Submitted) 2003

Miller J, Fragar L, Franklin R. *Tractor runover injury in Australia*. Australian Centre for Agricultural Health and Safety and Rural Industries Research and Development Corporation. 2003.

Project Title:	Rural health and safety intervention for the Agricultural sector in the South West of WA

RIRDC Project No:	WAC-2A
Researcher:	Dr. Samar Aoun and Ms Anne Jennings
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Objectives

- Raising awareness of agricultural community of farm safety issues through an educational program
- Assessing risk profiles and specific hazards
- Recommending effective education, training and support strategies to develop the skills necessary for adoption of best practices in farm health and safety.

Background

Despite significant statistics on fatality and non-fatal injury rates, there is a low adoption of farm safety practices and farm safety remains a low or low-to-medium priority for most farmers. Previous reports have highlighted the need for studies that more directly investigate factors that impact on farmers' uptake of safety initiatives, and in particular measures that increase the proportion of farmers who take advantage of programs such as Managing Farm Safety (MFS). It is in this context that a safety promotion initiative has been proposed in the South West of Western Australia (2001-2002).

Research

The project was conducted in two stages: a feasibility study and a postal survey. The first study tested the feasibility of conducting a brief educational session in the workplace or the meeting place of service clubs and farmers' organisations and helped to refine the data collection tool. Lack of interest in these presentations, low response rates and lack of trainers warranted a change of methodology to a postal survey that involved peak organisations rather than small local service clubs. The postal survey consisted of farmers completing information on the nature and extent of injury on their farms in the past year and an assessment of their training needs in safety practices.

Outcomes

Eight peak organisations agreed to participate and a total of 306 farmers/growers participated in the two stages of the study. The extent of susceptibility to injury, 26 to 40 major injuries per 100 farms per year, confirmed the need for such safety promotion programs to increase the proportion of farmers who take advantage of safety courses. Sixty percent of injured farmers stopped work with an average of seven days of lost productivity, 63% being treated by a doctor and 12% requiring a short stay at the hospital. Ninety percent of injured were male with a median age of 40 years. The lack of awareness of the role, functions and courses of Farmsafe WA (7% were very aware of the course) and the confusion of the organisation with Worksafe WA undermined the success of the brief educational presentations. Worksafe WA is seen as a disciplinary organisation and only 17% of farmers were very aware of the difference between the two organisations. The low levels of awareness were coupled with low levels of motivation to seek further information on the Managing Farm Safety course, with members of all eight participating peak organisations exhibiting similar low levels of awareness and motivation. There was a general feeling of resentment that farmers were swamped with courses often useless and by an influx of new invasive regulations, which have not proved to be a good match to the highly valued 'common sense'.

Implications

The study highlighted many barriers that impacted on farmers' uptake of safety initiatives and therefore lost opportunities to progress the adoption of safe practices in the South West of WA. It indicated that over three-quarters of farmers were still at the pre-contemplation stage, with no intention to initiate changes or attend the course and only 10% were highly motivated. Drawing on the experience of initiatives focused on men in

the health field, the course probably needs to be redesigned to appeal to men's learning style which is more skill-based, more topic-focused and one that requires delivering 'soon and certain' outcomes. The prevailing alliance between Farmsafe WA and two of the participating organisations in this study has not been reflected in better levels of awareness or motivation compared to the non-allied organisations, suggesting the need for more effective alliance at the grassroots level rather than at the bureaucratic level and more inclusive of all peak organisations.

Publications

An article has been submitted to the Journal of Rural Society for consideration for publication.

Research in Progress

Farm Health and Safety

Project Title	Reducing all-terrain vehicle injury

RIRDC Project No: CUT-7A
Start Date: 1-Jan-01
Finish Date: 30-Nov-03
Researcher: Dr. Tony Lower
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Objectives

- To identify the efficacy of ATV training to reduce injury prevalence and severity in a high risk group.

Current Progress

In March 2001 an existing validated instrument (pre-intervention survey) covering a range of issues relating to ATV use and self-reported injury, was assessed for test-retest reliability.

Following verification of the reliability, the questionnaire was distributed to six Western Australian Agricultural colleges (n=440) with response from 330 (73%) of participants).

The colleges were then grouped into one of two categories matched on gender, agricultural activities, and the number of students that have access to an ATV on the family property (this was clarified by the questionnaire).

A representative from each of the six Agricultural Colleges was trained by Honda Australia rider Training and was accredited in the delivery of an ATV course.

Subjects in the intervention group (Group A) received competency based ATV rider training in June 2000. The control group (Group B) received the standard curriculum that involved no attention to the issue of ATV safety.

In June 2001 a post intervention survey replicating the initial pre-intervention survey was completed.

June 2002 another post-intervention survey replicating the initial pre and post-intervention surveys was conducted.

The results from the follow-up surveys are currently being analysed using chi-squares to identify variations in self-reported injuries between group A and B, with multiple logistic regression being used to identify predictors of injury. A cost benefit analysis of the introduction of the training in respect to injury outcomes will also be completed.

Project Title	Organophosphate exposure in agricultural workers: human exposure and risk assessment.

RIRDC Project No:	QUT-5A
Start Date:	7-Jan-02
Finish Date:	30-Nov-04
Researcher:	A/Prof. Michael Capra
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Objectives

- To improve farmers ability to monitor and asses their exposure to organophosphate (OP) pesticides by examining the usability of urine metabolite testing as a risk assessment tool for agricultural workers.
- To develop and pilot risk assessment guidelines for organophosphate exposed agricultural workers based on urinary metabolite analysis.
- To provide information of use to rural doctors for the correlation of symptomology and biological monitoring results by investigating correlations between urine metabolite levels and OP related symptoms and other health effects.

Current Progress

A pilot study involving 11 farmers was completed by the end of 2002. The selection of farmers for the pilot study and the main study was achieved with the full cooperation of the Queensland Fruit and Vegetable Growers (QFVG). The pilot study aimed to test the reliability and validity of the structured interviewer-administered questionnaire. The collection of data from the main study began early in 2003 with 25 farmers already completing the interviewer-administered questionnaire and 12 farmers providing urine samples for analysis of organophosphate metabolite concentration. The participants have been fruit and vegetable growers drawn from the Southeast farming areas of Queensland including: Gatton, Toowoomba, Laidley, Lowood, Tamborine Mountains and the Redlands. The second phase of the project involving organophosphate pesticide formulators is awaiting approval from the companies involved, but data collection should commence after July this year. Data collection will be continuing throughout this year. The project has strong industry and government support from the QFVG, the Queensland Division of Workplace Health and Safety and Workcover NSW.