

LOST TIME INJURIES IN FOREST SILVICULTURE - 1995

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Summary

- 84 lost time injuries resulted in a total of 474 work days lost.
- There was a steady increase in the number of injuries occurring each hour from 7 am to 11 am.
- Workers with less than one year's experience were the most frequently injured.
- 71% of injuries resulted in less than six days off work.
- Most injuries occurred in pruning with slipping over between trees being the most frequent cause of injury.
- Other frequent pruning injuries were falls from ladders and being hit by a severed branch.
- During thinning the most common injury was laceration inflicted by the chainsaw.
- Slipping over was the cause of 80% of plotting injuries.

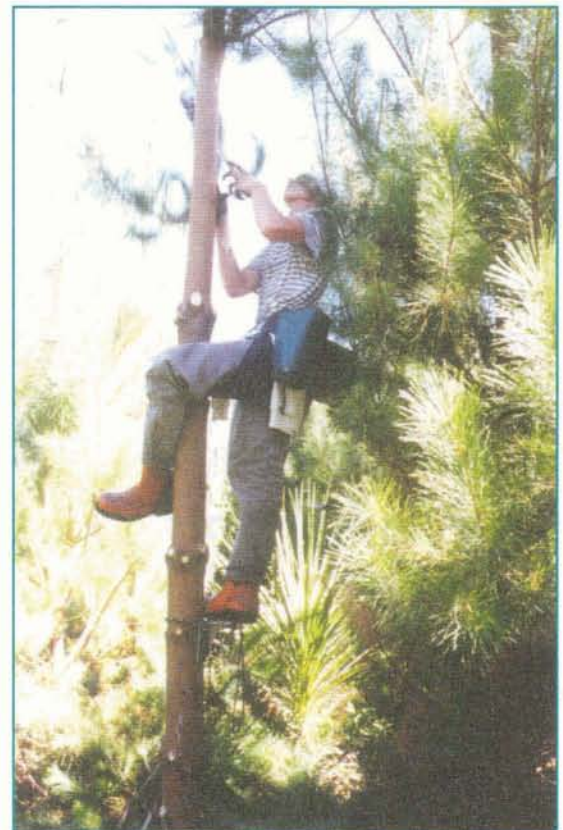


Figure 1 - Pruning with loppers

Table 1 - Injuries and incidents recorded by the ARS

Report Type	1994	1995
Fatal	0	0
Lost Time	128	84
Minor	10	52
Near Miss	4	14
Total Reports	142	150

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Introduction

This report summarises the information contained in the Forest Silviculture Accident Reporting Scheme (ARS) for 1995. This is the sixth year of data collection. Logging injuries for 1995 are summarised in Parker (1996). Forest silviculture includes the following operations: nursery work, establishment, releasing, thinning to waste, pruning and forest maintenance.

The following definitions are used by the ARS:

- lost time - the injury causes the injured person to miss any full day's scheduled work
- minor - first aid or medical treatment required, but lost time as defined above does not apply
- near miss - first aid or medical treatment not required but the incident could have caused injury (includes property damage).

Acknowledgments

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Analysis of lost time injuries

Lost time per injury

The average number of days lost per injury was 5.6 which is similar to 1994 when an average of 5.0 days were lost. The number of days lost ranged from one to 60 days with a median of three days.

A total of 474 work days were lost in 1995 compared with 630 work days lost in 1994. The majority of injuries (71%) resulted in one to five days off work (Figure 2). These injuries are not recorded by the Accident Rehabilitation and Compensation Insurance Corporation (ACC) Integrated Information System database which records information on injuries resulting in more than five days off work.

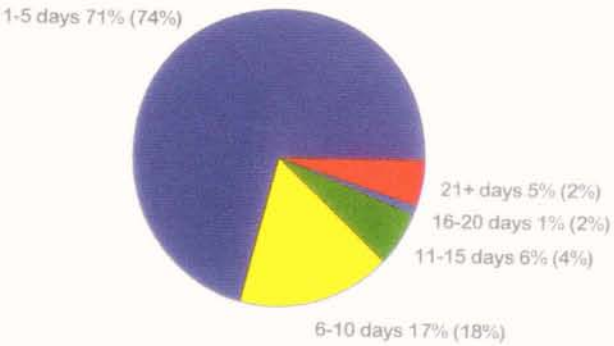


Figure 2 - Distribution of lost time per injury (1994 equivalent in brackets)

Time of injury occurrence

MONTH OF YEAR

There was an uneven distribution of injuries through 1995 with most (74%) occurring in the first seven months (Figure 3). Almost all the injuries in the period January to April (26 injuries, 31% of all lost time injuries) were in pruning. This corresponds with the period of greatest pruning activity. A second peak of injuries occurred in July. They were two each of planting, nursery, plotting and pruning and one thinning. Six of the eight injuries in October were pruning.



Figure 3 - Month of injury

DAY OF WEEK

In 1995 there was an equal proportion of injuries through the first four days of the week and significantly fewer on Friday and Saturday (Figure 4). This is different from previous years when more injuries

were reported early in the week. Often fewer hours are worked on Friday and many crews do not work in the weekend. There was no pattern in the types of injury (for example sprains, lacerations, bruises) or the operation undertaken at the time of injury.



Figure 4 – Day of week of injury

HOUR OF DAY

There was a steady increase in the proportion of injuries occurring each hour from 7 am to 11 am (Figure 5). This is similar to the pattern of injury in 1994. Fatigue due to the long period of time since breakfast may contribute to the increase in injuries in the morning. If a forest worker eats the ideal breakfast, the energy contained within that meal will only last for a period of four hours at forest worker energy expenditure levels (Kirk, Gilbert & Darry, 1996). After 10 am crews break for smoko so fewer workers will be working during any particular hour. In 1995 there was an increase in the proportion of injuries which occurred between 3 pm and 5 pm. Half (four of eight) of the falling off ladder injuries occurred after 2 pm, possibly due to heat and/or fatigue.

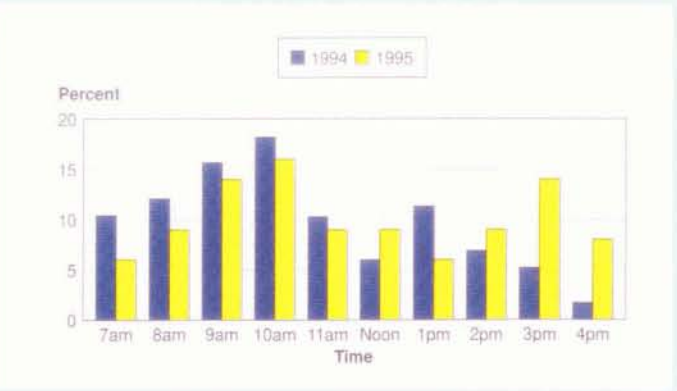


Figure 5 – Time of day of injury

EXPERIENCE

As in 1994 inexperienced workers were injured more frequently than experienced workers (Figure 6). Information from the 1994 Forest Owners' Association Forest Workforce Census (Byers, 1995) indicated 18% of silviculture workers had less than six months' experience. The 1995 Silviculture ARS figures showed that this group had 27% of all lost time injuries.

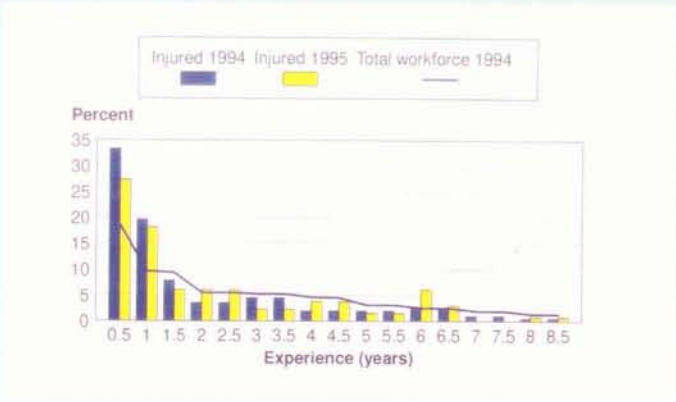


Figure 6 – Comparison of experience of silviculture workforce (Byers, 1995) with experience of injured silviculture workers (Parker, 1995)

Type of operation

Table 2 – Lost time injuries by operation

Operation	No. of injuries	Average days lost	Total days lost
Planting	7	2.6	18
Pruning	43	5.3	227
Thinning	13	10.7	139
Plotting	6	3.4	21

PLANTING

There were seven lost time injuries in planting with a total of 18 lost days. The most serious injury was a cut to the eye (five days lost). This injury occurred when the planter bent down to plant the tree and was poked in the eye with a piece of bracken. There were three strain injuries, two to the back and one to the wrist (total of five days lost, Figure 8).

In planting, the upper torso (shoulders, chest and upper back) was most frequently injured. There were two upper torso injuries – a strained back (two days lost) while planting and bruised ribs when

a planter slipped and fell on his planting bucket (four days lost).

PRUNING

There were 43 lost time injuries in pruning with a total of 227 days lost. As in previous years, pruning accounted for most (52%) lost time injuries. The most frequent cause of injury was slipping over while walking between trees, resulting in 11 injuries and 89 days lost (Figure 8). The most severe "slipping over" injury occurred when a pruner caught his foot on an old fence and slipped on greasy ground. He dislocated his knee and was off work for 31 days.

Eight injuries were the result of falling from the ladder (total of 51 days lost). This is fewer than in 1994 when 14 injuries and 112 work days were lost. Four of the 1995 ladder injuries resulted from the ladder slipping off the tree, two injuries resulted from falling off the ladder (ladder still attached to the tree) and two injuries resulted from falls when a ladder step or clip broke.

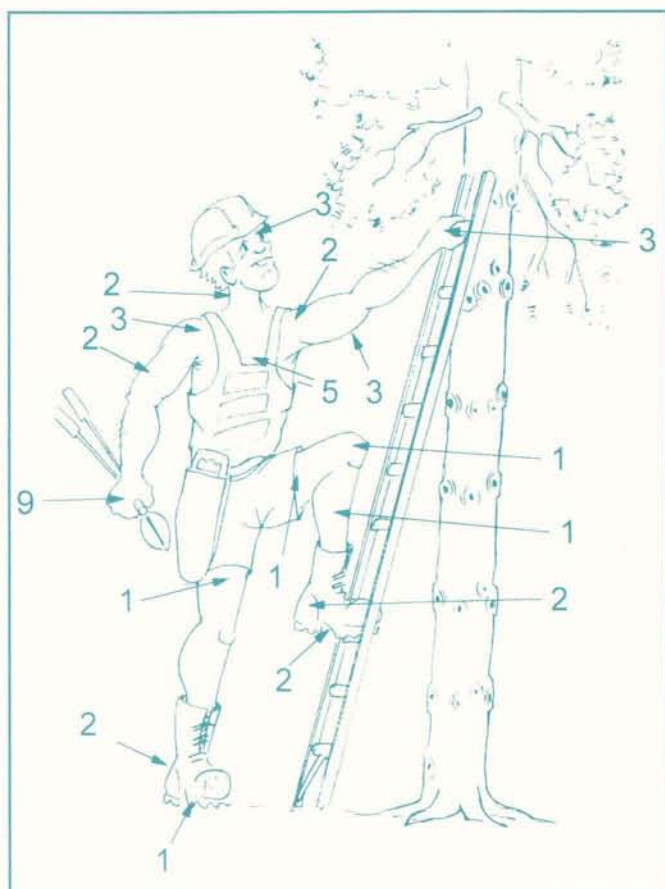


Figure 7 - Parts of body injured during pruning operations

Being struck by falling branches as they were being pruned resulted in eight injuries and a total of 18 days off work. Most injuries (five) were bruises resulting in one or two days off work. However, eight days were lost when a jacksawed branch fractured a pruner's finger.

Other causes of injury were:

- infections from prickles, five injuries, total of 11 days lost
- kickback from chainsaw, two injuries, total of three days lost
- strains, four injuries, total of 15 days lost
- cut or crush by loppers, three injuries, total of 27 days lost
- hit by own ladder, two injuries, total of 14 days lost.

The most frequently injured body part in pruning was the right hand. There were nine injuries and a total of 33 days lost (Figure 7). The most severe hand injury was 15 days lost when the worker's thumb was crushed in the lopper handles as they were being folded.

The most common hand injuries were infections from prickles and insect stings (four injuries and a total of 10 days lost).

Upper torso injuries were particularly common in pruning resulting in five injuries.

There were two falls while climbing the tree:

- "King grip step rope broke, fell on chest", seven days lost
- "ladder clip gave way - broke ribs", 20 days lost.

Two falls occurred when walking between trees (total of six days lost).

One strain to the chest "braced lopper handle on chest to cut big branch", five days lost.

Thinning

There was a total of 13 lost time injuries and 138 days lost in thinning to waste operations. The most common type of injury was laceration inflicted by the chainsaw (six injuries and 39 days lost, Figure 8). Two of the chainsaw injuries occurred during maintenance and the remaining four injuries were reported as kickbacks.

Three serious injuries were the result of being hit by falling trees:

- fractured lower leg , 60 days lost
- fractured hand, 21 days lost
- cut head, seven days lost.

Slipping over resulted in a total of three injuries and nine days off work.

The hands and lower legs were the most frequently injured parts of the body in thinning to waste operations with three injuries to each.

Two of the hand injuries were inflicted by the chainsaw:

- "pushing scrub away with hand, chainsaw kicked up", five days lost
- "slackening bar nut, slipped", one day lost.

The remaining hand injury resulted in a fracture "hit by vine which pulled up as tree fell", 21 days lost.

There were two chainsaw lacerations to the unprotected backs of the legs with a total of 17 days lost. A driving tree slid back off the stump, fracturing a thinner's lower leg - 60 days lost.

Plotting

There were six injuries during plotting, resulting in a total of 21 days lost time. Three injuries were to the knee or upper leg and were the result of slipping over (Figure 8). Slipping over also resulted in one upper torso injury and one lower torso injury. The most severe injury was a strained knee with 10 days off work. The injury occurred when the worker slipped into a hole in the ground covered with fern. The one plotting injury not due to slipping over was a cut hand inflicted while sharpening a slasher, two days lost.

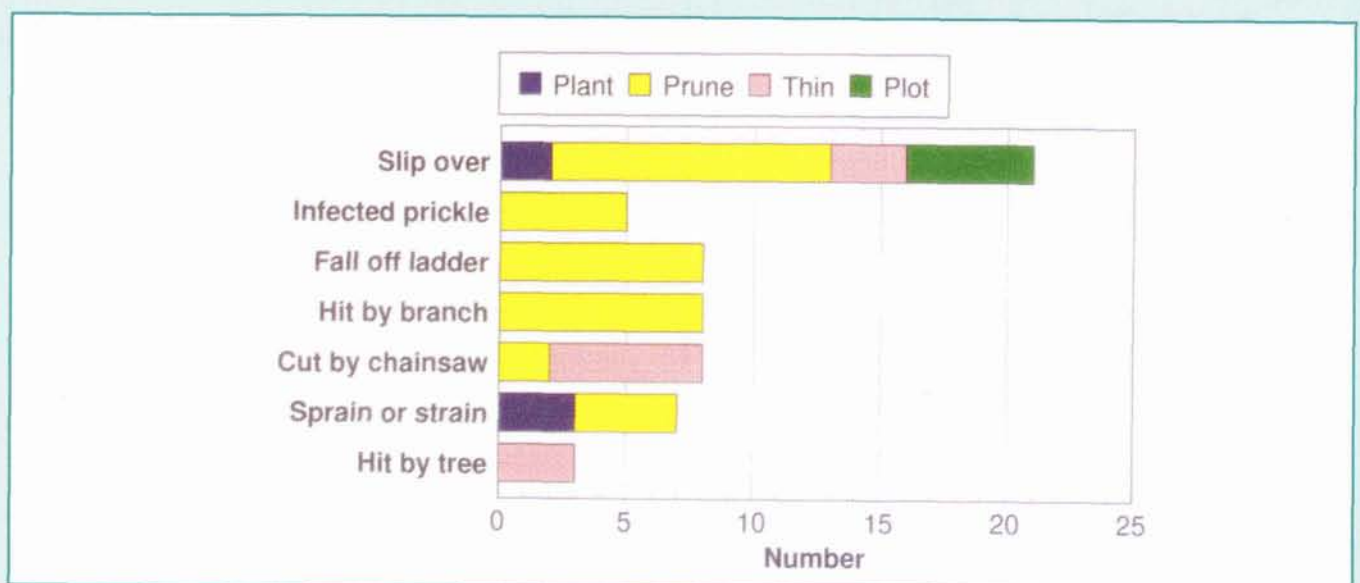


Figure 8 - Immediate cause of injury in planting, pruning, thinning and plotting

Discussion and Conclusions

Major findings to come from the 1995 Forest Silviculture ARS were:

- most lost time injuries occurred during pruning operations with slipping over between trees being the most frequent cause of injury
- the single most common cause of injury in silviculture operations was slipping over
- the most severe injuries occurred in thinning
- workers with less than one year's experience had a greater rate of injury than more experienced workers.

The problem of poor traction has been addressed by using spiked boots in logging. Spiked boots could be used in silviculture operations too. However, they cannot be used in ladder pruning where the spikes would provide poor footing on ladder rungs and may prove awkward in planting.

Good pruning technique, as used by well trained and experienced pruners, would reduce the chance of strains and sprains, falls from ladders and being hit by severed branches. Kirk, Gilbert & Simpson (1996) detail injury prevention routines for forest workers.

Infections are normally easily prevented by good first aid treatment and hygiene and a visit to the Doctor if needed. Adequate food and fluid intake throughout the day combined with rest breaks is a proven way of reducing the impact of fatigue on worker safety and performance (Kirk, pers comm).

It is essential that the forest industry continues to support the ARS by reporting lost time and minor injuries and near miss incidents so that research, training and management efforts can be focused to improve worker safety.

References

Byers, J.S. (1995) : "New Zealand Forest Owners' Association Forest Workforce Census - 1994". Liro Project Report 57.

Kirk, P.; Gilbert, T.; Darry, K. (1996) : "Increased Safety and Performance Through Smart Food". Liro Report, Vol 21 No. 26.

Kirk, P.; Gilbert, T.; Simpson, M. (1996) : "Injury Prevention Warm-Up Routines for Forest Workers". Liro Report, Vol 21 No. 27.

Parker, R.J. (1995) : "Lost Time Accidents in Forestry - 1994". Liro Report, Vol. 20 No. 13.

Parker, R.J. (1996) : "Analysis of Lost Time Accidents - 1995, Logging". Liro Report, Vol. 21 No.21.