TEXAS GIN ACCIDENT SURVEY RESULTS

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Abstract

Four ginning seasons of accident data have been collected by Texas Cotton Ginners' Association Field Safety personnel. Analysis of the data indicates several areas where increased efforts should yield a significant reduction in accident rates. These areas are worker training; implementation and enforcement of lock-out/tag-out programs; utilization of proper tools, personal protective equipment and work practices; and improved housekeeping.

Introduction

We have been collecting data for our current program since 1993. Before this, we had access to data from the various insurance companies, but the information was limited to that which insurance companies find useful.

Data for insurance purposes resembles the same data needed for our purposes, but is slightly different. We tend to need more details regarding exactly what happened, and exactly what type of equipment was involved. We decided that the best way to get the data we wanted was to design our own survey form, and to collect our own data.

We realized if we collected our own, detailed data, we would have to be careful that any questions be answered consistently. One problem with detailed, open ended questions is that the questions become somewhat subjective, and the answer will change slightly depending on who is completing the survey. For example, even the definition of a significant accident will vary from person to person. We do not limit our survey to lost time accidents, as formally defined, since there are many minor accidents that are important, such as smashed fingers around the press. On the other hand, a splinter from a board probably is not indicative of any trends, and would not be useful in the survey.

In order to maximize the consistency of our survey, we decided that the best way to gather the data was to have our Field Safety Representatives go into every gin each year, and fill out the forms while interviewing the gin manager. This process also helps our Field Safety Representatives to become more familiar with other details surrounding the accident. We have done this for the last four seasons.

Data Collection

Each year, we have analyzed the data, and provided a summary for our members. We have learned a lot from four years of data, and the following paper attempts to explain some of the trends we are seeing. Some of the graphs that follow will show all four years of data, and others will only show averages. When the data had the same trend for all years, we averaged it to make the graph simpler. When the data changed from year to year, we made sure all four years worth of data were shown.

Figure 1 shows that we have collected data for 532 accidents. You will note that our injuries peaked in 1994/1995, and have been decreasing since then. We would like to say that this trend illustrates how much injuries have been reduced in Texas cotton gins, and our safety efforts are the reason for the decline. We have seen fewer accidents at the press, lint cleaners, and gin stands during these years, and these are probably actual reductions.

Another part of this trend, however, has to do with the personnel collecting the data. As mentioned before, deciding which accidents are worth recording is a subjective call. The fact that we had a large reduction in the number of accidents with no machinery affiliation indicates we did not record many of the smaller accidents during the last two years. We have also been affected by turnover in our West Texas position. New Field Representatives may not have developed the confidence and the relationships with the ginners necessary to ensure the best possible data collection. As you will see in the following analysis, minor accidents are a major part of our overall accident picture. In the future, we will be making a stronger attempt to be sure we collect all appropriate accident data.

Data Analysis

First, we will go through some of the more obvious trends. As you can see in Figure 2, most of the accidents occur during the day. We might have expected most to be at night, but this trend holds every year. One explanation is that most non-emergency repairs are done during the daytime, and this increases exposure. Another possible reason for this is that much of the work out in the yard, such as loading motes and repairing equipment is done during the day. In addition, at least part of this trend is due to the fact that some gins are not operating at night, especially during the beginning and end of the season. A fourth possibility is that some gins may put their more experienced workers on the night shift.

Figure 3 shows that most accidents occur while the gin is operating. This tends to support the idea that many of the day injuries are happening during the normal cleaning and minor maintenance that is going on while the gin is operating. The second largest number of injuries occur while the gin is dormant (during the off season). This

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further illustrates the importance of having a safety program covering safety while repairing and doing maintenance. Our focus tends to be on the machinery itself, since that is where the most serious injuries occur. We tend to forget about the large number of minor injuries caused by the above factors. These injuries are also costly, and tend to knock some of our best workers out of commission.
The third largest number of injuries occurs while the gin is choked. Many of these are also among the most serious accidents, caused by machinery being started back up while someone is inside, or by someone getting into a machine before it is completely stopped. A good lockout/tag-out program will eliminate the vast majority of the potential risk associated with un-choking machinery.

Figure 4 shows that our accidents often occurred during the middle of the shift. Some of this is due to worker fatigue, but most of it is probably the human nature of the person being interviewed. Most people would unconsciously call the first and last hours the beginning and end of the shift, with the middle ten hours being the middle of the shift. What is significant, however, is that there seems to be more accidents at the beginning of the shift than there are at the end. This indicates that fatigue may not be as large of a factor in many accidents.

Figure 5 shows most workers who are injured have been on the job for one year or less. Figure 6 shows that the worker is almost always at their normal job, and is typically working properly. The call of whether a worker is working properly is very subjective, as you might imagine. These results might be interpreted to simply say the worker was where he was supposed to be, and doing nothing noticeably wrong.

Taken together, these two figures tell us that training is absolutely essential, and that we need to improve our training efforts. These efforts should include general safe working practices, and not just a simple run through of their basic job functions.

Figure 7 shows the injury frequency of each part of the body in our survey, averaged over four years. Figure 8 is more illustrative, however, since it details the top five areas of the body for each year. Hands, Fingers, and Arms are easily the most injured areas of the body, when taken as one group. This probably should be considered as one group for these purposes, since these injuries are often a matter of severity. For example, a lint cleaner saw may amputate a finger, hand, or arm depending on the accident. This also may be a judgment call on the part of the data collectors. Note that during the last two years, hand injuries decreased while finger injuries increased. With some injuries it is a matter of opinion whether to call it a hand or a finger injury.

With the above comments in mind, Figure 8 strongly illustrates the importance of training. We need to train our ginners, and gin hands alike, in the importance of lockout/tag-out and in the importance of proper working techniques to protect their arms, hands, and fingers. These are their most important tools. Once gin plant leadership modifies their work habits, the rest of the crew will follow. This is a critical part of your overall safety program.

The decrease in back injuries probably is best related to the changes in our workers compensation laws, and the crackdown on fraudulent injury claims. Valid back injuries and leg injuries are typically related to improper lifting, or slip and fall type of accidents. Better training and better housekeeping would go a long way toward eliminating these types of injuries. Using the proper tools for the job is also important in eliminating these injuries. Finally, a smaller number of leg injuries are due to being caught in gin machinery. These account for a smaller number of injuries, but most are very serious.

Figure 9 shows that there is a marked difference in the injury rates between job description, as would be expected. One especially concerning factor is the number of Ginner accidents. While there are three higher categories, this is probably due to the fact that a large number of people around the gin fit into the Gin Hand, Other Press, and other categories. There is usually only one ginner per crew, however.

Figure 10 is a breakdown of the five jobs where most injuries occur. Notice that the Ginner, Gin Hand, and Other Pressman are among the most often injured each year, closely followed by other workers, and yard workers. We will get into more details on how these five types of workers are injured later in this paper.

Figure 11 details what the workers in each job category were doing when they were injured. The ginners and gin hands are most likely to be hurt while doing a miscellaneous repair. This does not include repair of machinery, and is more like grinding, using a chisel and hammer, working on a truck, or welding.

The second two most likely causes for an injury to the ginner and gin helper are repairing and un-choking gin machinery. Un-choking is more dangerous for the ginner than repairs, and the risk is even between the two for gin hands. This illustrates very clearly how our best people get hurt. They think they are familiar enough with the machinery that they do not have to lock it out. They will not let anyone else do it, but they do it themselves, and then get hurt. Show your ginners this data, and help them to understand that programs like lockout/tag-out are for everyone. If this data does not convince your ginner and/or superintendent to lock-out the equipment every time, it may be worthwhile to add some incentives or penalties for them into your safety rules.

The other three job categories are most likely to be hurt while the gin is running. This includes everything from being hit by the bagger or a forklift to having a hand smashed by the door on the press, or slipping on the gin floor. These accidents normally happen while the gin is running, and while these workers are not attempting to repair anything. Un-choking is also a concern for the Other category of employees, while material movement is a concern for the press and yard people.

What does all of this tell us? It says our yard and press people are hurt while the gin is running. They try to man-handle a bale, back into something on a forklift, or become careless and get their hand caught in the press. These are the types of injuries we find with these workers.

The Ginners and Gin Hands are most likely to be hurt while performing minor repair work on non-gin machinery. They are also very vulnerable to injury while repairing gin machinery.

The Ginners, Gin Hands and Other employees are very subject to injury while un-choking the machinery. This is probably the most important trend we see. Even though the number of injuries is less for this type of accident, the severity of this type of accident is usually high. Most of our really bad accidents are caused by people un-choking machinery before performing the proper lockout/tag-out program.

Figure 12 illustrates where workers are hurt. The press is the largest single machine, followed by the lint cleaners and gin stands. Again, even though the lint cleaners and gin stands are lower, these are typically the most severe injuries. Accidents are fairly evenly distributed throughout the gin, as 35% of the accidents were in many different types of machinery. No one machine in this group was responsible for more than two or three percent of the accidents. More surprising, however, is that no machine was involved in 19% of the injuries. This is an indication of how many slips, falls, and dust in the eye type injuries are out there.

Another area of concern is the number of vehicle accidents. All combined vehicles represent 12% of the total accidents. This is a larger number than either lint cleaners or gin stands. Module and Burr trucks alone represent almost half of these accidents, making them a major safety concern. While many of these accidents are minor, this trend clearly illustrates the importance of having well qualified and well trained drivers.

Figure 13 attempts to combine the previous three, to get some correlation between machine type and job type. This graph also differs in that these are actual injury numbers, not percentages, in order to illustrate how often our press crews are being injured. Although these are often less serious injuries, the numbers are quite high. Notice that the Ginner and Gin Hand are also quite susceptible to the press, although most of their exposure probably comes during downtime situations. The bale handling systems are also a significant source of injury, especially for the press crew.

Gin Hands are most likely to have an injury un-related to any machine. Again, this goes back to those injuries caused by carrying heavy parts, working with a hammer and chisel, fixing a truck, and similar injuries.

Ginners live up to their name by being the ones most likely to be hurt in a gin stand, although this is a significant source of injuries for the Gin Hand.
There is one additional point to be made by this chart. Note that of all the machinery categories, there are only two machines that have injured all types of employees. The first is the bale handling system. This is probably due to the accessibility of this system, since it conveys the bale out of the gin. More concerning, however, was that the only other machine in this group would be the lint cleaner.

We know lint cleaners are responsible for some of our most serious injuries. It is surprising, however, that so many different workers are exposed to them. Many gins have policies to allow only trained people around the lint cleaners. For some reason, other workers are getting back there too. Something as simple as enforcing existing rules may help eliminate many of these accidents.

Summary

The key to reducing accidents lies in understanding why they occur, and then implementing programs and procedures to eliminate the reasons for their occurrence.

This data indicates to me that four areas need improvement. These four areas, if implemented completely and properly, would do a lot to reduce our accident rate. These items are, in order of importance:

- Train workers more thoroughly, and more effectively.
- Implement and enforce proper lock-out/tag-out at all times.
- Utilize proper tools, personal protective equipment, and procedures for the job at hand.
- Improve housekeeping.

I hope this information helps you and your workers to understand how the accidents are occurring in Texas Cotton Gins. By understanding how accidents occur, we can better find ways to eliminate them.

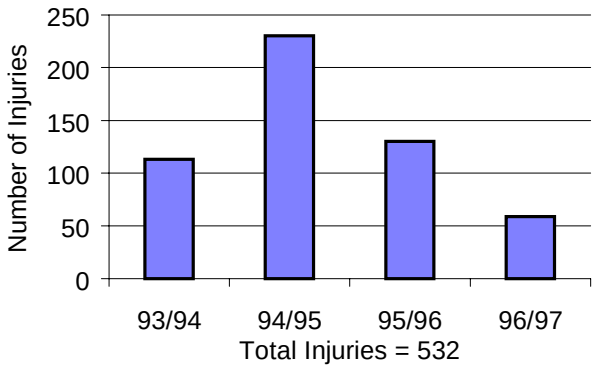

Figure 1. Total Injuries by Year.

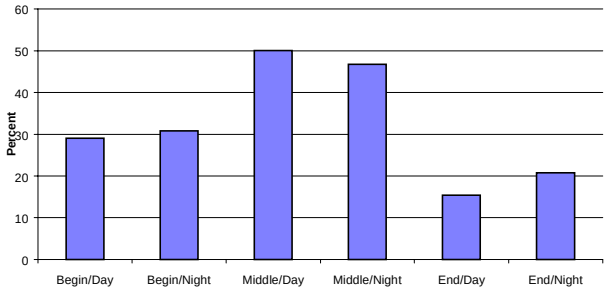

Figure 4. Accidents During Parts of the Day/Night Shifts - 4 Year Average.

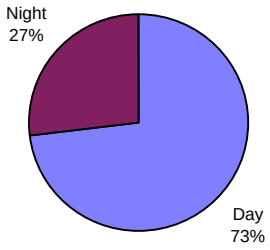

Figure 2. Accidents by Shift - 4 Year Average.

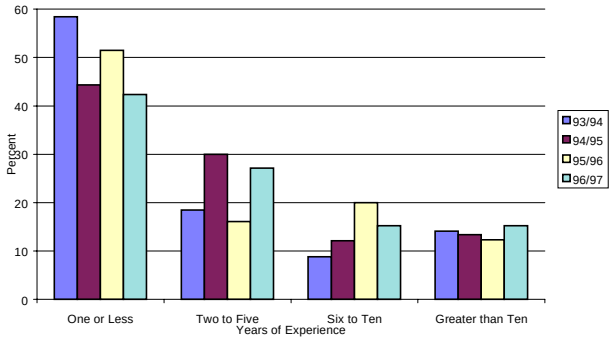

Figure 5. Injuries by Years of Experience.

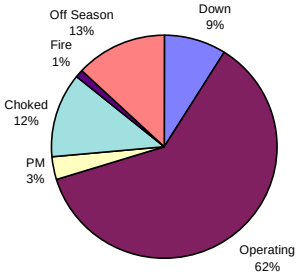

Figure 3. Accidents by Gin Status - 4 Year Average.

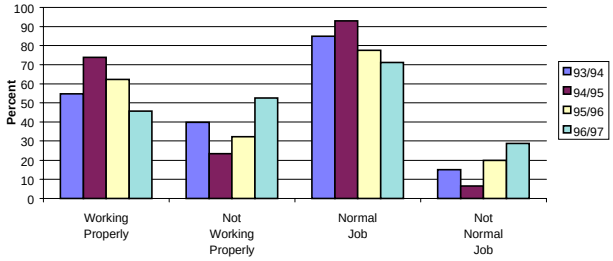

Figure 6. Work Practices.

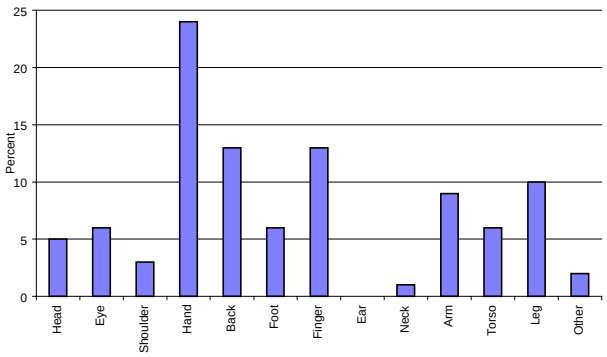

Figure 7. Accidents by Part of Body Injured - 4 Year Average.

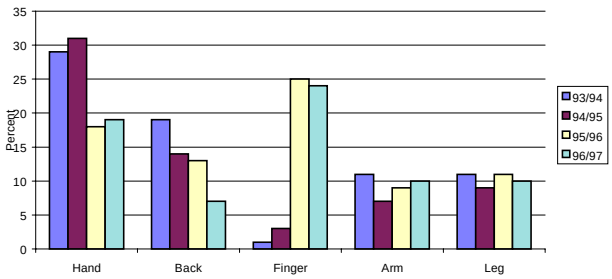

Figure 8. Top Five Body Parts Injured in Accidents.

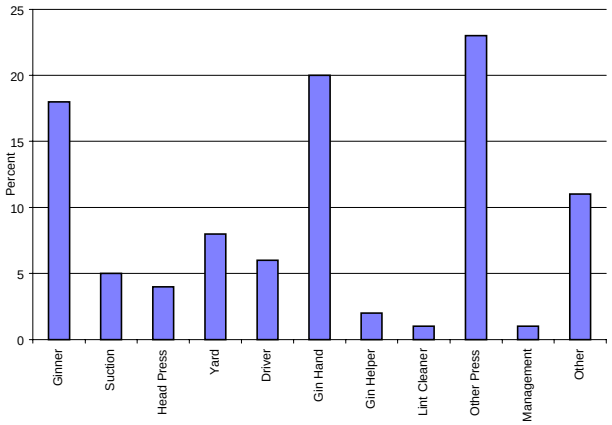

Figure 9. Accidents by Job Type.

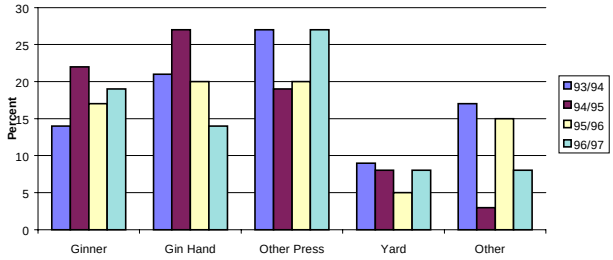

Figure 10. Top Five Job Types by Accidents.

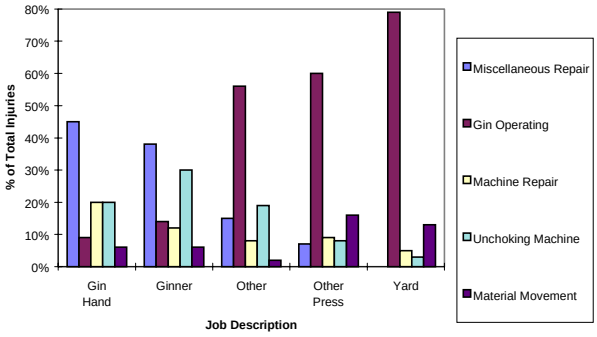

Figure 11. Accidents By Gin Status.

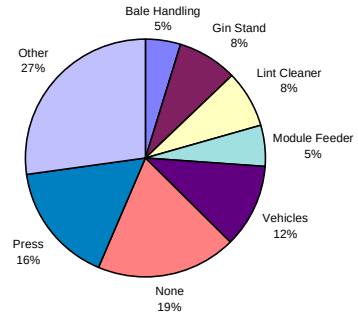

Figure 12. Accidents By Machine.

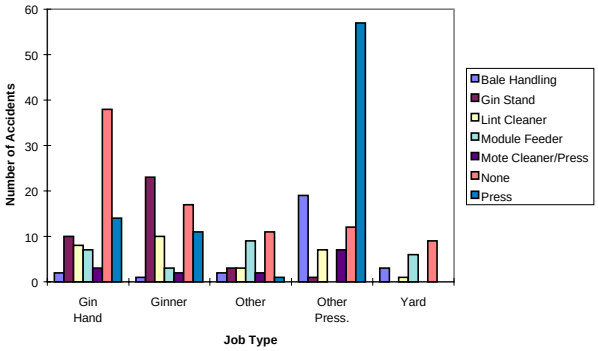

Figure 13. Injuries by Machine and Job Type.