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Concerns of Custom Harvesters

R. W. Steffen, K. W. Frazier, D. G. Watson, T. V. Harrison.

ABSTRACT. *This study elicited the perceptions and concerns of custom harvesters regarding safety and health issues faced in their operations, self-perceived knowledge of selected regulations, and self-perceived ability to train employees on the safe operation of equipment. The average age of custom harvesters' (CH) employees was 22 to 25 years (47.2%). The most common length of the harvest season was 5 to 6 months (70.9%). The most common responses to length of work day were 9 to 11 hours (34.5%) and 12 to 14 hours (54.5%). In general, CH ranked combine operation experience as most important when hiring employees. The CH felt inexperience was the leading contributor to lost-time incidents. They were most concerned about DOT regulations and Worker's Compensation rules, but also felt they had a good knowledge of those areas.*

Keywords. *Custom harvesters, Perceptions, Regulations, Safety, Safety management.*

Custom harvesting plays an important role in production agriculture throughout the grain belt of North America. The Association of Canadian Custom Harvesters, Inc. (ACCHI, 2006) defines a custom harvester as a professional who harvests a variety of crops, on a contract basis, for other farmers throughout the North American grain belt.

According to Landis (2001), custom harvesting started in the 1920s, but it really took off in 1944. During World War II, a bumper crop and shortages of manpower and fuel created a need to harvest more effectively. To alleviate this situation, the U.S. government allowed the Massey-Harris company to produce 500 new Massey-Harris combines to dedicate to this effort; they were organized into a "Harvest Brigade." Each year, custom harvesters make their way to Texas to begin harvesting and work their way north through the grain belt and into Canada.

An accurate estimate of the number of custom harvesters is difficult to determine, and no reliable estimates were found. One indicator is the membership in trade associations. U.S. Custom Harvesters, Inc. (USCHI), the largest trade association in the U.S., claims about 700 members (Topeka, 2003).

Likewise, it is extremely difficult to find estimates of injury and loss rates for custom harvesters. A check of the OSHA website revealed that no standards have been cited by OSHA for SIC code 0722: Crop harvesting, primarily by machine. This suggests that either OSHA has not found any custom harvesting operation to be in violation of standards or it has not inspected any custom harvesting operations. Likewise, the

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National Safety Council (NSC, 2002) does not have a separate category for custom operators. Anecdotal evidence during data collection on this project suggests that a lack of data may prevent an accurate assessment of the true injury situation. Data may be available from the insurance industry, but was unavailable for this research.

Many custom harvesters (CH) are farmers who contract their harvest crew to other farmers. They are likely to operate in multiple states and deal with multiple regulatory agencies. This is complicated by numerous exemptions and special provisions given to agriculture. For example, under U.S. Department of Transportation rules contained in CFR 383, 390, 391, and 395 (U.S. DOT, 2007a, 2007b, 2007c, 2007d), there are exemptions for agriculture (including custom harvesters) to hours of service rules, commercial drivers license (CDL) age requirements, and log book requirements (within 150 air-miles). However, individual states can place additional restrictions on these exemptions. There appears to be some confusion among operators as to which regulations apply, and under what conditions. Pertinent regulations include the Fair Labor Standards Act of 1938 (FSLA), the Occupational Safety and Health Act of 1970 (OSHA), and the Migrant and Seasonal Agricultural Worker Protection Act of 1983 (MSPA) (Economic Research Service, 2002), as well as Federal Motor Carrier Safety Administration (FMCSA) and state DOT regulations. The focus of this study was on CH perceptions, so an exhaustive study of federal and state rules was not undertaken.

While custom harvesting is best categorized as an agricultural service, it shares many characteristics and similarities with production agriculture in terms of operation, equipment used, and hazards faced. These hazards include rollovers, entanglements in machinery, slips and falls, flying object hazards, strains, and respiratory illnesses brought on by exposure to dust and chaff. The CH industry faces many of the same safety issues as production agriculture. Some CH operations are family based, while other operations may employ several employees, who may be domestic citizens or foreign workers. Since these operations are seasonal, workers are typically hired during the most time-urgent seasons, when stress is high and the pace rapid. Under these conditions, workers are more likely to use riskier shortcut methods to get the work done (Scharf et al., 1998).

The goal of this study was to elicit the perceptions and concerns of custom harvesters on agricultural safety and health issues. Specific objectives were:

- Determine custom harvesters' concerns on current regulations affecting their operation.
- Determine perceptions of factors contributing to accidents.
- Determine self-perceived knowledge and ability to properly train employees.

The findings of this study will be useful to professionals developing training programs for CH.

Methods

A 16-item questionnaire was developed based on the literature and on one author's (Frazier) personal experiences as a CH employee. The instrument contained questions pertaining to custom harvesters' concerns on issues that affect their operation, perceptions of their ability to train new employees on safety issues, and demographic information. The survey was administered to self-selecting CH at the 2005 annual spring convention of USCHI. A table was provided to the researchers, and a display was erected. USCHI members were encouraged to participate through announcements made in the conference sessions. Interested custom harvesters were asked to participate.

Since this study was a self-selecting sample of USCHI members rather than a random sample of the CH population as a whole, generalizing the results and conclusions to the

general population of custom harvesters is not appropriate. The results reflect the perceptions of only that group in attendance at the annual USCHI conference who agreed to participate. Since this was not a random sample, inferential statistics are not appropriate, and descriptive statistics were used to describe the perceptions of the participation group. Fifty-five individuals completed the survey.

However, this research should provide a starting point for discussion and further research into this area. The responses are summarized with descriptive statistics and presented below.

Results and Discussion

The CH were asked demographic questions pertaining to the size of their operation, the average age of their employees, and the length of harvest season. Custom harvesters were asked to indicate the average age of their employees using the categories 18 to 21, 22 to 25, 26 to 29, 30 to 34, and 35+. Of the 53 usable responses, 47.2% indicated the average age of their crew to be between the ages of 22 and 25. The distribution of responses can be seen in table 1.

The CH were also asked the age of the oldest and youngest employee. Responses to this question ranged from 13 years of age for the youngest to 78 years of age for the oldest. According to the Hazardous Occupation Orders for Agriculture (HOOA), children under the age of 16 are not to be employed operating tractors or machinery in an agricultural operation unless they have completed an approved training program (U.S. DOL, 2004). However, from comments made by the CH, these employees were likely family members helping in the harvesting operation, and therefore not covered under HOOA.

Custom harvesters were asked to indicate the number of employees in their operation by selecting from these categories: <5, 6 to 10, 11 to 15, and 16+. Fifty-four responded to this question, and the distribution of their responses can be seen in table 2.

It should be noted that the responses to the first two categories (<5 and 6 to 10) contained a majority of the responses (35.2% and 46.3%). This suggests that this group of CH had a slightly lower number of employees than the average of the participants in the CHAMP program, which reported an average number of employees at season peak of 13.2 in 2004 (Dhuyvetter and Kastens, 2004).

Table 1. Average age of employees.

Age Group	Frequency	Percent
18 to 21	7	13.2
22 to 25	25	47.2
26 to 29	7	13.2
30 to 34	8	15.1
35+	6	11.3
Total	53	100.0

Table 2. Number of employees on crew.

Operation Size (No. of Employees)	Frequency	Percent
<5	19	35.2
6 to 10	25	46.3
11 to 15	4	7.4
16+	6	11.1
Total	54	100.0

Custom harvesters were also asked the number of years of experience that their crew members possessed. Table 3 presents the distribution of CH responses. Approximately one-half of the managers indicated that their crews had less than two years of experience, and one-half of the crews had more than three years of experience. The CHAMP program found that employees will stay with a crew for an average of 2.1 years (Dhuyvetter and Kastens, 2004).

Custom harvesters were asked to indicate the length of their harvest season by selecting one of four categories. The distribution of their responses can be seen in table 4. A large portion (70%) indicated a season of 5 to 6 months. Kastens and Dhuyvetter (2005) found an average season length of 6.3 months.

Custom harvesters were also asked to indicate the strategy they used to rotate personnel among work assignments. Slightly less than half indicated they assigned employees the same duties the entire season, while 17.6% use a standard rotation of jobs (table 5).

When asked about the length of the workday, just over half indicated that their typical work day was 12 to 14 hours, with another third indicating that their typical day was 9 to 11 hours (table 6), with the average work week being 6.5 days.

Table 3. Reported years of experience of crew members.

Years of Experience for Crew Members	Frequency	Percent
Less than 1	5	9.3
1 to 2	20	37.0
3 to 4	15	27.8
>5	14	25.9
Total	54	100.0

Table 4. Indicated length of harvest season.

Length of Season in Months	Frequency	Percent
1 to 2	1	1.8
3 to 4	8	14.5
5 to 6	39	70.9
Other	7	12.7
Total	55	100.0

Table 5. Work assignments of employees.

Work Assignments	Frequency	Percent
Do the same job the entire season	23	45.1
Used where needed for the day	19	37.3
Standard rotation through jobs	9	17.6
Total	51	100.0

Table 6. Average hours of work a day indicated by custom harvesters.

Average Hours per Work Day	Frequency	Percent
6 to 8	3	5.5
9 to 11	19	34.5
12 to 14	30	54.5
15+	3	5.5
Total	55	100.0

The questionnaire asked custom harvesters to rank what types of experiences they consider important when hiring new employees, using a scale from 1 to 5 (1 = most important, 5 = least important). The choices were: prior experience on a custom harvest crew, experience operating a combine, experience driving a truck, general farm experience, and no experience at all. Forty-eight (N = 48) surveys contained usable data. The results are shown in table 7. When examining the confidence intervals, it appears that the CH prefer combine operating experience over prior custom harvesting experience. They also prefer that employees have some type of experience over no experience at all.

Custom harvesters were also presented with this question: "Thinking of lost-time damage or injury incidents you have experienced in typical operation, rank the following factors as to which you think most often contributes (1) to what you think least often contributes (6)." The six categories were: employee fatigue, employee inexperience, employee maturity, low visibility due to darkness, improper maintenance, and employee impatience. As shown in the rankings seen in table 8, the CH ranked employee inexperience, employee maturity, employee impatience, and employee fatigue similarly. The CH did not appear to feel that improper maintenance (4.60) and low visibility due to darkness (4.73) were major contributors to lost-time incidents.

While no other questions were asked to obtain more detail for these responses, comments made by participants and one author's (Frazier) experiences with custom harvesting suggest that additional causes of lost-time incidents could be related to long work days, long periods of time between days off, and the stress of an extended harvest season.

Custom harvesters were asked to rank the following factors as to which most commonly influenced the ending time of their work day: harvest/crop conditions, operating hours of the grain terminal, management decisions based on conditions of crew, or other reasons. There were 49 (N = 49) usable responses. The mean ranks were: harvest/crop conditions (1.20), operating hours of grain terminal (2.31), management decision based on the condition of crew (2.63), and other reasons (3.88).

Custom harvesters were asked to rate their concern about common issues of safety and health management for their operation on a scale of 1 (most concerned) to 4 (least concerned). They were also asked to rate their knowledge about the same issues. The choices were: Worker's Compensation issues, regulations concerning bio-terrorism, Department of Transportation (DOT) regulations, and Occupational Safety and Health

Table 7. Hiring criteria for custom harvesters based on size of operation.

	N	Mean	SD	95% CI
Combine experience	48	2.06	0.86	1.81 to 2.31
General farm experience	48	2.52	1.21	2.21 to 2.90
Truck driving experience	48	2.73	1.15	2.37 to 3.03
Prior custom harvesters experience	48	3.06	1.29	2.70 to 3.43
No experience	48	4.65	1.21	4.37 to 4.90

Table 8. CH rankings of perceived causes of lost-time incidents.

	N	Mean	SD	95% CI
Inexperience	48	2.35	1.59	1.91 to 2.73
Maturity	48	3.00	1.69	2.55 to 3.53
Impatience	48	3.10	1.75	2.69 to 3.57
Fatigue	48	3.13	1.48	2.74 to 3.51
Poor maintenance	48	4.60	1.55	4.14 to 5.06
Darkness	48	4.73	1.50	4.33 to 5.07

Table 9. Self-perceived concern and knowledge about selected regulations.

	DOT Regulations		Worker's Compensation		OSHA Regulations		Bio-Terrorism Regulations	
	N	Mean	*N*	Mean	*N*	Mean	*N*	Mean
Concern	41	1.49	41	1.90	41	2.80	41	3.81
Knowledge	31	1.52	31	1.77	31	2.87	31	3.84

Administration (OSHA) regulations. Missing and incomplete surveys decreased the *N* value on this portion of the survey. As can be seen in table 9, CH were most concerned about, and felt they had the best knowledge of, DOT and Worker's Compensation regulations.

While no follow-up questions were asked to go into further detail on this matter, comments made by the participants suggest that their levels of concern and knowledge about these regulations could be based more on the presence of enforcement. Since transportation on roads is a highly visible aspect of custom harvesting, the probability that custom harvesters will be checked or inspected by law enforcement officers is greater than the likelihood that OSHA will inspect their operation. Therefore they are more concerned with, and feel better prepared on, these regulations.

The last question the custom harvesters were asked was if they feel they have adequate knowledge to train their employees in the area of safety. They were asked to rate this self-assessment on a 5-point scale with 1 being strongly disagree and 5 being strongly agree. Of the CH surveyed, 3.6% indicated they strongly disagreed, 1.8% disagreed, 10.9% were neutral, 30.9% agreed, and 50.9% strongly agreed.

Conclusions

While this study used a self-selecting sample of members of the USCHI and generalizations are inappropriate, it provides a starting point to identify areas of concern that could be addressed. The following conclusions were drawn from this study.

- DOT regulations are the biggest concern to custom harvesters, and they also feel most knowledgeable about these regulations.
- Custom harvesters prefer individuals with some combine or truck operating experience, or general farm experience, over those without experience when looking for new employees.
- Custom harvesters perceived the top four causes of lost-time incidents to be inexperience of the employee, maturity of the employee, impatience of the employee, and employee fatigue, respectively. This may be due to the fact that custom harvesters are not getting the experience level they seek when they hire employees.
- Custom harvesters consider themselves to be adequately knowledgeable and prepared to be able to train their employees.
- Most employees of custom harvesters are 22 to 25 years of age, with about half having less than two years of experience on harvest crews. This suggests a high turnover of a fairly young and inexperienced work force.

Recommendations

Based on the findings of this study and the literature available, the following recommendations are offered:

- A thorough evaluation of regulations should be conducted to provide custom harvesters with a well-researched summary of the specifics of the regulations that ap-

ply to them. This should be reviewed on a regular basis to keep abreast of regulatory changes.

- Since DOT regulations are a major concern to custom harvesters and since regulations may vary from state to state, a booklet or pamphlet should be put together that summarizes the regulations affecting custom harvesters in each state.
- Further analysis of injury data and regulatory citations should be conducted to determine if significant problems exist in the industry to warrant investment in specific training materials and further research.
- If further study is warranted, a research plan should be developed using a variety of methods, starting with focus groups to identify initial areas of concern, followed by surveys and other techniques to collect the needed information from custom harvesters to guide the development of research agendas, and training and management resources for custom harvesters to use in providing their employees with the tools necessary to protect themselves.

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