Labor Demand, Recruitment, and Worker Retention of the 1992 Caneberry Harvest Workforce

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Robert Mason
Professor
Survey Research Center
Oregon State University
and
Tim Cross
Assistant Professor
Agricultural and Resource Economics
Oregon State University

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AUTHORS: Robert Mason is Professor, Survey Research Center and Tim Cross is Assistant Professor of Agricultural and Resource Economics, Oregon State University.

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Introduction

The 1992 harvest year saw the full implementation of two significant pieces of legislation concerning the hiring and the wages of caneberry harvest workers. The first was implementation of the Immigration Reform and Control Act of 1986 (IRCA). That Act, designed to stabilize and legalize the supply of farm workers in the United States, may have created more doubts than assurances over the supply of workers who typically flock to the state each year to pick fruit.

The second was the full implementation of the state's minimum wage law, requiring growers to pay at least $4.75 an hour for labor, including piece-work labor.

While farm employers worry about an adequate labor supply, little information has been available about the demand for workers or about the ability of different types of workers to pick fruit. This study follows from the one completed in 1990 that provided initial estimates of the industry's demand for hand labor (Mason, Cross and Thomas, 1992).

The use of mechanical berry harvesters complicates the estimates for labor. Any statistical model that accounts for the demand of hand labor must account for the acres harvested by both machine and by hand. As the use of

machines increase, for example, demand for hand labor may be expected to decrease. As we will see, this is not what happened in 1992 when we compare the size of the labor force with the 1990 harvest.

The caneberry acreage remained unchanged between 1990 and 1992, at an estimated 10,910 acres, according to the Oregon Agricultural Statistical Service. The amount of fruit harvested, however, increased about 20 percent, to 74,010,000 pounds in 1992. Worker-numbers and machine-harvested acres did not follow the expected harvest adjustment. We will discuss these findings more fully in the results section of this report.

Data for the survey were gathered by self-administered questionnaires mailed to all known caneberry growers in the fall of 1992. Growers were asked about the number of 1992 acres in production, percent of the crop hand- and machine-harvested, as well as the number of workers and the time required to harvest the crop. Recruitment and retention efforts were sought, in the survey, as were the percent of the work force that could not make minimum wages on a piece-work basis. Finally, growers were asked for their major concerns about the 1993 harvest.

Questionnaire items, marginal frequencies, and other summary statistics are reported in Appendix A. Completion rates are presented in Appendix B. The method for estimating the size of the work force is given in Appendix C.

Results

Size of the harvest work force.

An estimated total of 17,686 workers were employed to pick the 1992 caneberry crop for average harvest period of 31 days. Table 1 shows the frequency distribution for different types of workers.

Table 1. Frequency distribution for types of Oregon caneberry harvest workers, 1992

Type of worker	Percent of workers: 16 or older	Under 16
Local workers who are U.S. citizens	45%	70%
Local workers who are non-U.S. citizens	27%	10%
Workers from other areas who are U.S. citizens	4%	2%
Workers from other areas who are non-U.S. citizens	23%	18%
Total	100%	100%
(N)	(16,982)	(707)

Size of the work force decreased 22 percent compared to the 22,792 workers employed to harvest the 1990 crop. Workers under 16 years old made up only 4 percent of the work force. (Only 84 growers reported hiring any, 35 percent of the sample.) Locals who are U.S. citizens made up nearly half (45 percent) of the adult work force; aliens, both local and from other areas, made up about one-fourth

each. U.S. citizens from other areas made up the remaining 7 percent of the work force.

Reasons for decline in the number of workers.

The decline in the number of workers stems from several causes. At first, one might think that an increase in the amount of acres machine-harvested is the reason, but that is not the case. Our analysis shows that about 18 percent fewer acres were machine-harvested in 1992, as the data in Table 2 show.

Table 2. Percent of caneberry acres hand- and machine-harvested, 1990 and 1992

Type of harvest	1990	1992
All hand-harvest	32%	37%
Hand/machine mixed ...	12%	25%
All machine-harvest ..	56%	38%
Total	100%	100%
(N)	(6,375)	(6,038)

The 18 percent fewer machine-harvested acres reflects a doubling of hand/machine-mixed harvest and a 5 percent increase in all hand-harvested acres. The motivation for fewer machine-harvested acres may stem from higher prices for the hand-picked crop. Prices fluctuated greatly between 1991 and 1992, depending on the type of berry harvested, but ranged from a 64 percent increase for red raspberries to an 18 percent increase for boysenberries, according to Miles

(1992). (Because of a large crop, evergreen berry prices declined about 15 percent.) We estimate that yields were about 15 percent less with machine-harvest, compared to hand-harvest pickers. Higher prices, coupled with good yields, may have been attractive enough for growers to shift more to hand-harvesting to pick more fruit.

Such a shift is supported by differences in the number of days required to harvest the crop. It took an average of 24 days to harvest the crop in 1990, compared to 31 days in 1992. Machine-harvest takes less labor to pick a field than hand-harvest, because mechanical harvesters pick berries more quickly than hand-harvest workers. When one adjusts the number of 1990 pickers by the extra days required to harvest the 1992 crop, the adjusted work force drops to 17,730 pickers, only 44 more than the estimated 1992 work force.

The evidence also suggests that growers may have managed their 1992 work force more efficiently than they had in 1990. Comparing the stability of the work force for the two seasons is one way to check the possibility that growers were more efficient in managing their 1992 harvest. Nearly 40 percent said they hired their workers for two weeks or more in 1992, compared to 31 percent in 1990. With less worker turnover, both workers and growers benefitted from improved stability. Workers received more earnings and growers did not have to pay the turnover costs of hiring and managing new workers.

Non-harvest employment.

Like most labor-intensive crops, harvest activities represent peak labor demand for caneberry producers. However, workers are also employed for non-harvest activities, so we asked caneberry growers to estimate the number of worker-days of employment they used for non-harvest work in 1992. (A worker-day is defined as one person hired for any part of one day.) Worker-day estimates were collected for hired workers as well as non-paid family workers. Growers were asked to estimate non-harvest employment in six 2-month periods, beginning with January/February and ending with November/December.

In general, we found that non-harvest work is performed primarily by hired workers, just as harvest work is. Average non-paid worker-days for non-harvest work ranged from a low of 0.03 days during January/February to a high of 1.30 days during September/October. Average hired worker-days for non-harvest work were also lowest in January/February at 0.30 days, and peaked in May/June at 19.57 days. Average non-harvest worker-days per grower are shown graphically in Figure 1. This graph shows that most non-harvest labor is employed in the spring and early summer, when canes are planted, trained, and tied. Another high employment period is in the fall, when canes are pruned.
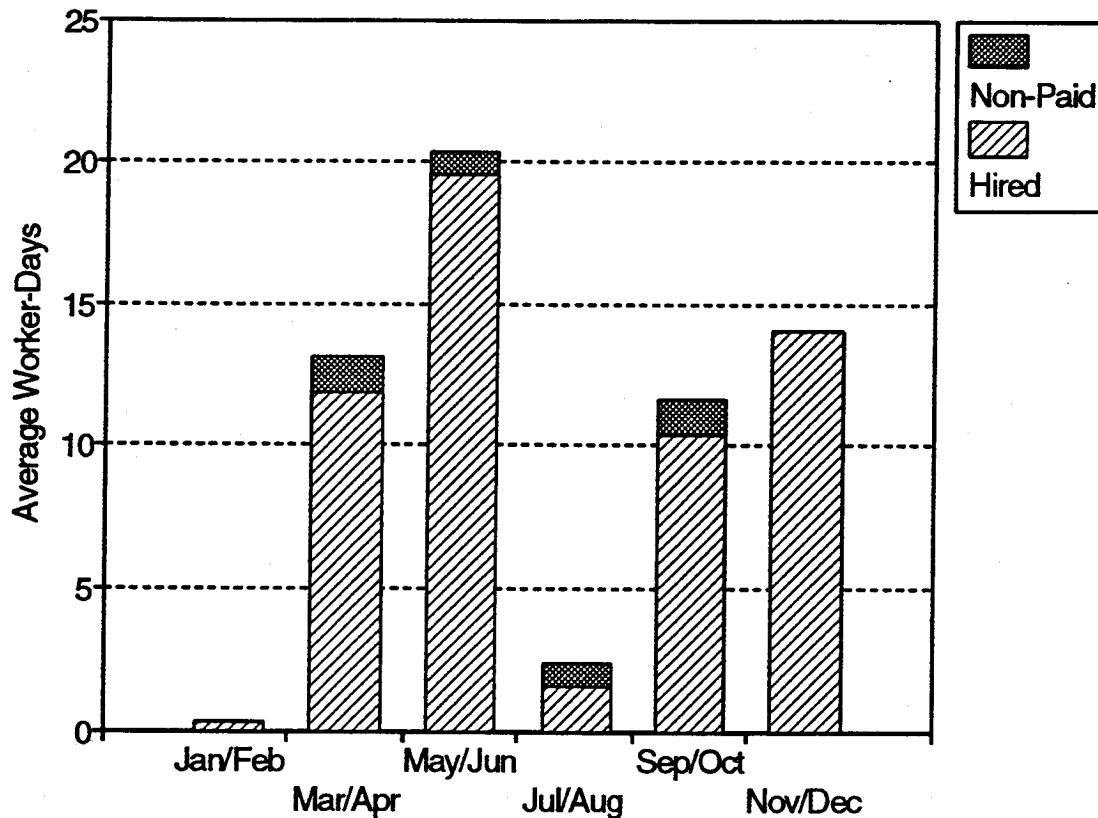
Figure 1. Average Worker-days Used Per Grower for Non-Harvest Work, 1992, Oregon.

Hired non-harvest worker-days for the 237 growers surveyed totalled 11,794. Using an expansion factor[1] of 1.807, total hired non-harvest worker-days for all caneberry growers is estimated to be 21,312 days. This is only 4 percent of the estimated 557,450 worker-days hired during

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[1]The expansion factor is the ratio of the total harvest acreage (10,910 acres) for the population to the total harvest acreage (6,038 acres) represented by the 237 respondents.

the harvest period, and provides a partial explanation of high worker turnover rates. With trivial employment available after harvest, workers have few incentives to remain with single employers throughout the harvest period. Expected higher earnings from other caneberry growers or from other hand-harvested crops may entice workers to move because they do not expect additional employment in the caneberry industry during non-harvest time periods.

Recruitment of workers.

The 1990 data also indicated that growers rely on several recruitment methods to locate workers. This trend continued in 1992, when growers used an average of two methods for recruitment purposes. For instance, 85 percent of the sample employed workers who returned year after year, 37 percent hired walk-ons, 34 percent relied on word of mouth by employees, and 21 percent employed a labor contractor.

We went beyond these summary figures to learn more about the quality of the different recruitment methods. We also asked growers to specify the "best", "second best" and "worst" methods of recruitment. The re-hiring of previous workers was cited by 47 percent of growers as the "best" method for obtaining qualified workers. Labor contractors were mentioned by 19 percent, word-of-mouth by 15 percent and walk-on's (no recruitment) by 13 percent. Two percent mentioned newspaper want ads and "other" sources. Percents

of "second best" and "worst" recruitment methods are shown on page 16.

Retention of workers.

Growers reported that it took them, on average, about 31 days to harvest their caneberry crops in 1992, with a minimum of 4 days and a maximum of 130 days to complete harvest. This long harvest period suggests that worker retention may be an important issue for caneberry growers. Those growers that are able to maintain a stable harvest work force will minimize the costs of worker turnover and reduce the possibility of experiencing labor shortages towards the end of the season.

About one-fourth of hand-harvest workers were employed 3 days or less for individual growers, and 60 percent worked 2 weeks or less, according to our respondents. This suggests that a significant amount of worker turnover occurs, although it is less than reported in 1990.

The most common method growers used to retain workers was to increase the piece-rate paid for late picking. Slightly more than half of surveyed growers used this approach. Other less common methods include providing on-farm housing, end of season bonuses, and free transportation. If worker turnover leads to inefficiencies, caneberry growers may want to adopt additional incentives to retain workers in the future, especially as labor supplies tighten and employment regulations increase.

Unharvested berries

Twenty-eight percent of the growers reported they left fruit unharvested in 1992, with an estimated value of $1,776,982. Poor weather, not labor shortages, seemed to be the main reason, as half the growers gave that for a reason. Some spot labor shortages occurred, however. One-fourth of the sample with unharvested berries said they could not find enough pickers to harvest all their crop. Workers either had left to harvest other fields or had shifted to other crops where picking was more favorable. Poor-quality fruit and low prices also were cited as reasons for leaving fruit unharvested.

Concerns over the availability of workers.

The availability of farm workers and worries over minimum wage requirements for piece-rate harvest are no longer uppermost in the minds of growers surveyed. For instance, when asked to list their major concern for the 1992 harvest, 32 percent of growers said market prices and 24 percent cited weather and pests as major concerns. Nine percent said yield and fruit quality was a problem. Labor availability and government regulations were mentioned by 11 percent and 7 percent of the sample respectively. Seven percent also mentioned worries over the minimum wage law. The shift from labor and minimum wage worries to traditional price and weather issues reflects the ability of the

industry, at least in 1992, to get labor and wage problems behind them. Growers seem to have recruited more productive workers in 1992, compared to 1990, who also stayed longer, enabling growers to harvest more fruit with fewer pickers.

Summary

This study of labor demand sought to document the farm labor needs of Oregon caneberry growers for 1992 and to compare differences between 1990 and 1992 harvests. Through a mail survey of growers, questions were asked about the number of acres raised and harvested, number of acres machine- and hand-harvested, age and type of worker employed, amount of nonharvest work, methods for recruiting and retaining farm workers, and concerns over the future of raising caneberries in the state.

The results show that the caneberry acreage remained unchanged from the 1990 harvest (10,910 acres). The number of workers decreased 22 percent (to 17,686). Acres machine-harvested decreased 18 percent (to 38 percent) while acres hand-harvested and mixed hand/machine-harvested doubled. The motivation for fewer machine-harvested acres may stem from higher prices for the 1992 crop. Machine-harvest reduces the amount of fruit picked by about 15 percent. Higher prices, coupled with good yields, may have been attractive enough for growers to shift to hand-harvesting to pick more fruit.

The non-harvest work force was only about 4 percent of the harvest work force.

Growers used multiple methods to locate and recruit farm labor. Workers were re-hired most often (85 percent); 47 percent of the growers said it was the "best" among several alternatives. Nineteen percent of the growers said that labor contractors were the "best" method for obtaining workers, 15 percent said word-of-mouth by employees was best, and 13 percent said walk-on's (no recruitment) was the "best" way to find workers.

Growers employed a number of incentives to retain workers. The most common incentive was to increase the piece-rate for late picking. Other incentives included on-farm housing, end of season bonuses, and free transportation from to and from the field to a worker's residence.

The availability of farm workers and worries over minimum wage requirements for piece-rate harvest are no longer uppermost in the minds of growers. Nearly a third of the sample said market prices and one-fourth mentioned weather and pests as major concerns. Labor supplies and government regulations were mentioned by 11 percent and 7 percent, respectively. The shift of concerns from labor and minimum wage worries to traditional price and weather issues reflects the ability of the industry, at least in 1992, to get labor and wage problems behind them.

References

Mason, Robert, Tim Cross and David Thomas (1992) <u>Labor demand and productivity estimates for the 1990 caneberry harvest work force</u>, Agricultural Experiment Station Special Report 889, Oregon State University, Corvallis, Oregon, 20 pp.

Miles, Stanley (1992) <u>Oregon county and state agricultural estimates</u>, Agricultural Extension Service, Special Report 790, Oregon State University, Corvallis, Oregon, 13 pp.

APPENDIX A: DESCRIPTIVE STATISTICS FOR SURVEY OF 1992 CANEBERRY GROWERS

1. How many acres of alternate-year caneberries, and of every-year caneberries did you <u>raise</u> in 1992? **(IF YOU DID NOT RAISE CANEBERRIES IN 1992, WRITE "NONE" AND SKIP TO QUESTION 15).**

	MEAN	(N)
a. Alternate-year berries . . .	6.50	(237)
b. Every-year berries	21.32	(236)

2. What percent of your total caneberry acreage in 1992 was made up of the following groups?

	MEAN %	(N)
a. Red and black raspberries combined . .	47	(234)
b. All other caneberries (Marion, Evergreen, Logan, Boysen, Kotata, etc.)	53	(234)

3. How many hired man-days <u>and</u> how many non-paid man-days, including family members, do you estimate you used for <u>non-harvest</u> work during each of the following two-month periods. (Include <u>everyone</u> who worked in the fields.)

		MAN-DAYS HIRED (Mean)	NON-PAID (Mean)	(N)			MAN-DAYS HIRED (Mean)	NON-PAID (Mean)	(N)
a.	JAN-FEB.	0.30	0.03	(228)	d.	JUL-AUG.	1.57	0.80	(208)
b.	MAR-APR.	11.88	1.27	(228)	e.	SEP-OCT	10.38	1.30	(207)
c.	MAY-JUN.	19.57	0.86	(228)	f.	NOV-DEC	14.05	0.08	(148)

4. Did you <u>harvest</u> any caneberries in 1992? (Circle one number)

(<u>N</u>)	PERCENT	
(4)	2	NO **(SKIP NOW TO QUESTION 15)**
(233)	96	YES

   4a. Please indicate what percent of your caneberry crop was hand harvested and what percent was machine harvested. Also give the actual number of workers required to do the harvesting.

	HAND HARVEST (Mean)	MACHINE HARVEST (Mean)	
a. <u>Percent</u> of crop harvested . .	46.8%	53.2%	(N = 233)
b. <u>Number</u> of workers required. .	31.0	3.8	(N = 214)

5.   How many days, altogether, did it take to harvest your crop?

   (N = 219)   MEAN = 30.89 DAYS MIN = 4   MAX = 130

(IF YOU HARVESTED ANY CANEBERRIES BY HAND PLEASE GO ON TO QUESTION 6, IF YOU ONLY HAD MACHINE HARVEST SKIP TO QUESTION 9)

6.   What was the average number of all pickers (including family members) in the field per harvest day? Just your best estimate please.

   (N = 140) MEAN = 29.0 PICKERS/DAY MIN = 1 MAX = 500 SUM = 4,063

7.   Considering all your pickers (including family), about what percent would you estimate worked for each of the time periods listed below during your caneberry harvest season? **(If none, please write "0")**

		PERCENT (N)
a.	Those who worked three days or less . . .	23.5 (137)
b.	Those who worked four days to one week. .	18.5 (137)
c.	Those who worked from one to two weeks. .	18.3 (137)
d.	Those who worked over two weeks	39.7 (137)

8.   Did you pay your caneberry pickers an hourly wage or by piece-rate?

(N)	%	
8	7	HOURLY WAGE
113	91	PIECE-RATE
3	2	BOTH

   8a. What percentage of your workers, if any, were terminated or left because they could not make minimum wage?

   5.4% PERCENT OF WORKERS

9.   What percent of your migrant or seasonal workers brought their families to Oregon? (Just your best estimate).

   (N=137)   MEAN PERCENT = 8.3   MIN = 0   MAX = 100

10. What percent of all your adult and teen-age workers, including family were from each of the following groups that harvested your caneberries in 1992? (Fill in your best estimate for each category. If "none", please write "0". Make sure your percents total 100% at the bottom of each column)

Percent of Workers:

	16 OR OLDER	UNDER 16
a. Local workers who are U.S. citizens	45%	70%
b. Local workers who are non-U.S.citizens	27%	10%
c. Workers from other areas who are U. S. citizens.	4%	2%
d. Workers who from other areas who are non-U.S.citizens	23%	18%
Total	100	100
(N)	(189)	(84)

11. Please tell us what percent of your workers were hired using each of the recruitment methods listed below. (Note: Read frequencies down "%USED" column. Percents total more than 100 because growers used more than one recruitment method.)

11a. If a caneberry grower came to you and asked you to name the best method for recruiting workers, which one method in Question 11 would you recommend as your **BEST** method, your **SECOND BEST** method and which would you advise was the **WORST** method?

	%USED	%BEST	%SECOND BEST	% WORST
A. Walk-on's (no recruitment) . .	37	13	11	15
B. Labor contractor	21	19	9	7
C. Word of mouth by employees . .	34	15	52	2
D. State employment office. . . .	2	0	5	33
E. Workers who return year after year.	85	47	18	2
F. Out-of-state phone solicitations that offer to supply workers .	0	0	0	28
G. Newspaper want-ads	3	2	4	12
H. Other (Specify_____)	10	2	3	0
Total	192	100	100	100
(N)	(238)	(175)	(159)	(145)

12. Please indicate whether or not you use the following methods to keep workers throughout the caneberry season?

		%YES	%NO	(N)
a.	Provide free food or meals.	11	89	(185)
b.	On-farm workers' housing	21	79	(185)
c.	Increase the piece rate for late picking.	51	49	(186)
d.	End of season bonus	18	82	(184)
e.	Provide or pay for transportation between workers' living quarters and field. . .	16	84	(185)
f.	Agreement with growers who need workers after the caneberry harvest	11	89	(184)
g.	Other (Specify_____) .	11	89	(186)

13. From what you know or have heard, what percent of your workers were unable to find housing.

(N=124) MEAN PERCENT = 12.0 MIN = 0 MAX = 100

14. Did you leave any portion of your caneberry crop unharvested in 1992? (Circle one number)

(N)	%	
(164)	72	NO
(65)	28	YES

14a. And, what is your estimate of the value of caneberries you left unharvested?

(N=60)   MEAN VALUE = $6,663 MIN = $50 MAX = $30,000
SUM = $399,780

14b. Please indicate whether or not the following contributed to not harvesting all of your crop? (Circle one number for each)

		%YES	%NO	(N)
A.	Poor weather.	51	49	(65)
B.	Low prices.	35	65	(65)
C.	Labor shortage. . . .	25	75	(65)
D.	Poor quality crop . .	43	57	(65)
E.	Other? (_____)	25	75	(65)

15. Finally, what is your major concern for the 1993 harvest?

	Concern	Percent
a.	Market price	32
b.	Weather, pests	24
c.	Worker availability. legal pickers	11
d.	Yield, crop quality.	9
e.	Government regulations	7
f.	Minimum wage law, costs, insurance	7
g.	Paperwork, documentation	3
h.	Avaiability of processors	3
i.	None mentioned	26
	Total	124
	(N)	(235)

APPENDIX B. SUMMARY OF COMPLETION RATES

Names and addresses of all known commercial caneberry growers in the state were provided by the Oregon Caneberry Commission. A total of 571 names were available for contact. An eligible respondent was defined as a grower who had harvested at least one acre of caneberries for processing in 1990. A total of 68 names were discarded because they were ineligible.

Three waves of mail questionnaires and one telephone contact were made.

Results of the contacts were:

	(%)	(N)
Returned	41.5	237
No berries raised in 1990	3.7	27
No commercial berries raised in 1992	0.5	3
No longer farming	1.8	10
Undeliverable/deceased ...	4.9	28
Refused	0.9	5
Not returned	45.7	261
Total	100.0	571

An overall adjusted completion rate of 47 percent was achieved, after non-growers and other ineligibles were subtracted from the base.

A random subsample of 50 names and addresses was drawn from the group that had not responded. A telephone interview was completed to determine if respondents met our definition of an "eligible grower". If they had, they were mailed a questionnaire and asked to complete and return it to the Center. Ineligible growers were noted and the response rate adjusted.

An adjusted completion rate, based on the results of the telephone interviews, returned mail questionnaires, and adjusted ineligibles increased our overall completion rate to 52 percent. This is lower than the overall completion rate of 56 percent achieved in the 1990 study.

Appendix C. Estimation of the Size for the Work Force of Hand Pickers

Direct measures of the size of the 1992 work force of hand pickers were not possible from the data available. The method used for estimation of hand-picked workers is described in this appendix.

The sample of respondents (n=234) was classified into three harvest-type strata: hand picking only (n=86), machine harvest only (n=88), and mixed hand picking and machine harvest (n=60). Only 59 farms from the 86 pure hand-picking farms provided sufficient information for the calculations that follow.

First, the number of workers for each farm is estimated as the ratio of the number of worker days required to harvest the crop (product of Questions 5 and 6) divided by the average number of working days per worker. The average number of working days per workers is calculated as the sum of products of the midpoints[1] of intervals for picking days and the corresponding proportion of workers in each interval (Questions 7a-7d). Next, the number of workers is multiplied by the worker-type proportions (Questions 10a - 10d). The resulting number of workers of each type (local workers who are U.S. citizens, etc.) are summed over the 59 farms in the pure hand picking group for which the number of pickers could be evaluated.

Finally, these sample totals are adjusted for the population by multiplying them by the expansion factor of 4.4449 derived as the product of two expansion factors. The first expansion factor is the ratio of the total hand picked acreage (3,756) from the 86 pure hand picking farms and the 60 mixed harvest farms to the acreage(1,528) in the mixed harvest group. The second expansion factor is calculated as the ratio of the total harvest acreage (6,038) represented by the 234 respondents to the total acres harvested (10,910) in the population. Thus, the estimated work force for the 59 farms in the evaluation group were expanded by (3,756/1,578)(10,910/6038) = 4.4449. The resulting estimates for the 1992 work force are presented in Table 1, page 3.

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[1] Midpoints employed were: for Q7a, 2; for 7b, 5.5; for 7c, 10.5; and for 7d, ((Q5-15)/2) + 15.`