



A vineyard pruner paid at a piece rate worked an average of 37% more quickly than those compensated at an hourly rate.

Pay method affects vineyard pruner performance

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A new study indicates that vineyard pruners paid on a piece-rate basis tend to work more quickly than those paid by the hour. Pay method had little effect on pruning quality as perceived by growers, although crews paid by the hour did seem to do a slightly better job. Total pruning costs were also influenced by vine vigor and vineyard location.

Does the way a vineyard pruner is paid — by the hour or at a piece rate — affect the speed and quality of the work done? A

1985 study indicated that the speed of pruners paid at a piece rate was consistent: an individual who pruned quickly or slowly on a given day tended to work at that same pace on any other day. In contrast, a given pruner paid by the hour tended to work at the same speed as other hourly paid workers. The main objective of our study in 1991 was to learn from growers how management and viticultural conditions affected pruning time and costs. Their perceptions on quality were also sought. Grower responses were based on vineyard data from winter 1990–1991.

Pay method (hourly versus piece rate) was the main management factor studied.

Viticultural factors examined included vine age, spacing, vine vigor, trellis type, training system, and pruning method.

With the emphasis on the variability of individual pruners, the 1985 study did not determine differences in overall productivity between piece-rate and hourly paid crews. The 1985 study did, however, examine variations in quality of pruning, but these differences seemed to depend on supervision rather than on pay method.

1991 study

Of the 5,000 questionnaires mailed to grape growers throughout California, 179 were returned, a response of 3.5%. Respondents included growers of table grapes (16), raisins (53), and wine grapes (108) from 15 counties: Fresno, Kern, Lake, Madera, Mendocino, Merced, Napa, Riverside, San Joaquin, San Luis Obispo, Santa Barbara, Santa Clara, Sonoma, Stanislaus, and Tulare. The 5-page questionnaire included a total of 35 questions. The two counties with the greatest number of responses were Fresno (51 responses) and Napa (35).

The two dependent variables used in this study, labor hours worked per acre and costs of pruning per acre, were closely related ($r = 0.71$). We considered labor hours worked per acre to be the more useful dependent variable because the amount workers are paid for a job depends largely on the local labor market's going wage or on a management policy to pay wages above, at, or below the labor market.

Pay method

Pruning speed. Analysis of the data indicated that raisin and wine grape workers paid at a piece rate pruned more quickly than did hourly paid workers. On average, hourly paid pruners required 26 labor hours to prune an acre (at \$158 average cost per acre); piece-rate-paid pruners required 19 labor hours (at \$115 average cost per acre) (table 1). In other words, hourly paid employees pruned only 73% as fast as piece-paid pruners, or, conversely, pruners paid at a piece rate worked at 137% of the rate of their hourly paid counterparts. Table grape respondents were too few for any inferences to be drawn.

Fifty-eight percent ($n = 102$) of all growers were satisfied with the pruning speed; an additional 38% ($n = 68$) were very satisfied. Four percent ($n = 7$) were dissatisfied with the pruners' speed.

Pruning quality. The questionnaire relied on the subjective feelings of growers to evaluate pruning quality. Fifty-five percent ($n = 97$) of respondents were satisfied with the quality of work, and 43% ($n = 76$) were very satisfied. Only 2% ($n = 4$) were dissatisfied with the quality of pruning work.

Two-thirds of the respondents were about equally satisfied with both the quality and the speed of pruning. The remaining third tended to be more satisfied with the quality than with the speed if they paid their pruners an hourly rate. The opposite was true of those who paid a piece rate.

Grape growers dissatisfied with pruning quality tended to have crew leaders who spent less time pruning and more time supervising crews. The amount of time supervising appeared to reflect these growers' perceived need to improve quality.

Forty-nine percent (n = 70) of raisin and wine grape growers responding indicated that their crew leaders' function was to supervise, although 31% (n = 44) replied that crew leaders mostly pruned and 21% (n = 30) responded that crew leaders did both. No table grape crew leader was reported as doing most of his or her work pruning. Table grape crew leaders were almost evenly divided among those who mostly supervised (n = 7) and those who did some supervising and some pruning (n = 9).

Pay. On average, piece-rate pruners were paid \$6.84 per hour; hourly paid pruners were paid \$6.20. Data derived by dividing cost per acre by labor hours per acre indicated that 5 of 61 growers (8%) paying piece rate and 3 of 79 growers (4%) paying hourly wages had pay scales below the minimum wage. Top hourly wage for hourly paid employees was \$10. Nine piece-rate-paying growers reported wages above \$10 an hour; the top piece-rate wage was \$24.85 an hour.

Benefits. Thirty-six percent of the responding growers provided nonmandated benefits to employees. Some, however, only provided benefits to year-round employees. These benefits, in descending order of occurrence, were health insurance

(21%), paid vacation (19%), paid holidays (9%), housing and utilities (6%), savings or retirement plan (6%), dental insurance (6%), bonus (6%), life insurance (3%), vision insurance (3%), paid sick leave or paid personal leave (3%), transportation or gas money (1%), and complimentary wine (1%). The questionnaire did not ask about degrees of employee or employer contribution to savings or insurance benefit plans.

Vine vigor

Responses came from growers with diverse vineyard conditions and diverse cultural practices. Most of these practices and conditions did not vary in a statistically significant manner with labor hours per acre. These factors may well have an impact on pruning speed, but this survey did not find it. The one notable exception was vine vigor. High-vigor vineyards took longer to prune. Low- (4%, n = 8), medium- (58%, n = 102), and high- (38%, n = 67) vigor vines required an average of 15, 22, and 26 labor hours, respectively, to prune per acre, averaged over both pay methods.

Other survey factors

Union activity. Four respondents (2%) were unionized — all of those were wine grape operations. Twenty-five respondents (14%) considered union activity a potentially serious threat.

Vineyard location. As expected, there were differences in costs of pruning, depending on vineyard location. Generally, the most expensive vineyards to prune were in the North Coast (Napa, Sonoma, Mendocino, and Lake counties), and the cheapest were in the San Joaquin Valley (table 2).

Two factors help explain these cost differences:

1. Differences in wages paid varied significantly from one location to another. Hourly paid wine-grape pruners, for instance, averaged \$4.58 an hour in the San Joaquin Valley, compared with \$6.32 in the coastal-plus-Riverside area and \$7.30 in the North Coast.
2. Although not statistically significant, vineyards varied in the labor hours per acre required to prune them. For instance, San Joaquin Valley wine vineyards required an average of 21 labor hours per acre to prune, compared with 23 labor hours in the coastal-plus-Riverside area and 25 labor hours in the North Coast region.

Crew size. Crews ranged from 1 pruner to 45. The average crew size was 9 workers.

Cultural practices. Ninety percent (n = 160) of pruners removed their own brush from under vines. Only 2% (n = 3) of the growers used a pneumatic pruning machine; only 3% (n = 5) did any mechanical pre-pruning. Twenty-nine percent (n = 52) hedged, 88% (n = 156) suckered, and 34% (n = 60) removed shoots during the growing season. Tasks for which most growers paid on an hourly basis were shoot removal (97% hourly), suckering (92% hourly), pruning supervision (88% hourly), vine trimming (80% hourly), and cane tying (49% hourly).

Concluding comments

Data from this questionnaire corroborate both visual observations and previous studies that point to faster pruning speeds for employees paid at a piece rate. The effect of pay method on speed is one of the few significant trends found in this study. How a worker was paid did not seem to affect the quality of work, as perceived by two-thirds of the respondents. The remaining one-third tended to be more satisfied with the quality of work paid for at an hourly rate.

Future research may include switching hourly paid crews to piece-rate wages and documenting changes in productivity and the duration of these changes. In addition, the effect of paying an incentive for improving the quality of pruning should be explored.

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TABLE 1. Pruning speed and cost per acre as a function of pay method and grape type

	Hourly pay		Piece-rate pay	
	Man-hours per acre	Cost per acre	Man-hours per acre	Cost per acre
Table	27 (n=9)	\$133 (n=9)	34 (n=4)	\$192 (n=5)
Raisin*	26 (n=11)	\$121 (n=11)	16 (n=31)	\$86 (n=36)
Wine*	26 (n=62)	\$168 (n=62)	19 (n=32)	\$134 (n=34)
Average for total sample*	26 (n=82)	\$158 (n=82)	19 (n=67)	\$115 (n=75)

*Highly significant at .01 or better.

TABLE 2. Pruning cost per acre as a function of vineyard location and grape type

	Cost per acre			
	San Joaquin, Stanislaus, Merced counties	Fresno, Madera, Kern, Tulare counties	Napa, Sonoma, Mendocino, Lake counties	Santa Barbara, San Luis Obispo, Santa Clara, Riverside counties
Table	—	\$131 (n=11)	—	\$191 (n=3)
Raisin	\$87 (n=2)	\$95 (n=40)	—	—
Wine*	\$106 (n=23)	\$100 (n=6)	\$175 (n=46)	\$155 (n=12)
Average for total sample*	\$104 (n=25)	\$103 (n=57)	\$175 (n=46)	\$162 (n=15)

*Highly significant at .001 or better.