

## Piece Rate Pay Design



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**“One means by which an employee has been able to keep his head above water and prevent being oppressed by the employer has been that the *employer didn't know just exactly what the employee could do.*”**

–N. P. Alifas (Taylor & Alifas, 1921:148, emphasis added).

Piece-rate pay has an enormous potential to satisfy the needs of both farm employer and crew worker alike. Farm employers who learn how to unleash the power of piece-rate pay will be at a competitive advantage over those who set it aside.

The use of piece-rate or some variation goes back to the times when

the children of Israel were enslaved in Egypt. A minimum daily productivity level was set for them in terms of “tales of bricks” (Exodus 5:18 KJV).

If it is to be successful, it is essential that the incentive pay principles already discussed in Chapter 9 are taken into consideration in designing such a pay system.



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*When piece rate is properly designed, growers can reduce costs while increasing productivity. At the same time, workers can earn substantially greater amounts.*

#### SIDEBAR 10-1

##### Do Piece-Rate Paid Crew Workers Leave after Making a Wage Goal?

Some farmers resist increasing incentive pay levels when compensating seasonal crew workers. They have hypothesized that workers have a certain earnings goal for each day and that once this goal is achieved, workers will go home. Economists would explain this phenomenon as the *income effect*: increases in income allow those in the work force to take more time for leisure activities.

But economists also speak of the *substitution effect*: the greater the

“Civilized nations,” a colleague at the University of California, Davis, argued, “have moved away from paying by the piece.” While piece rate is far from dead, it is true that it often fails to motivate employees as much as it could. Traditionally both the farm employer and worker have come to believe that the other is out to cheat him. Crew workers, as we saw in Chapter 9, live in fear that growers will cut their piece-rate pay—either now or next year—if they perform at their full potential. Piece rate is often associated with a game played between the two. Greed—on both sides—often gets in the way of success.

The good news is that when piece rate is properly designed, growers can reduce costs while increasing productivity. At the same time, workers can earn substantially greater amounts. Such farm enterprises are likely to have a waiting list of excellent people who wish to work for them and have little to worry when talk of labor shortages are raised.

At a seminar I asked growers, “How would you feel if some of your crew workers made twice the minimum wage and you still saved money?” The general consent was that this would be great. “How about three times the minimum wage?” I inquired next. “Would that make you nervous?”

“No, this would be wonderful!” exclaimed one of the producers. His

wages, the more a worker forfeits by engaging in leisure time. A study in numerous crops showed that fewer than three percent of crew workers out of more than 440 left work after reaching a wage goal for the day. About 11 percent of the respondents had at some time left earlier in the day, but the reasons given were (1) getting overly hot or tired or (2) not making a sufficient wage (i.e., low wages or not enough to pick). In either case, these workers were generally willing to stay longer if the earning opportunities were greater. Workers need to maximize earning opportunities when they can be fully employed. Leisure could come later, during “down time.”

neighbor, however, poked him on the side and said, “Now, be honest, you’d be scared spittles if some of your workers were making three times the minimum.”

Certainly, the very thought of farm workers making three times the minimum wage—or more—would send some producers straight to the trauma center. These growers are likely to feel that they made a mistake when they set up their piece rate.

Instead of panicking at the hourly equivalent that a piece-rate paid worker is earning, however, look at the bottom line, such as cost per vine pruned or pound picked.

Put yet another way, in the form of a question: “Does your farm operation make more money as your workers make more money?” If the answer is a ‘maybe’ or a ‘no,’ your pay for performance design is faulty. If the answer is a ‘yes,’ why worry because some of your workers are going home with their pockets full of money?

Farm employers who want to speed the process of having workers feel safe about putting forth their best efforts will want, at the very least, to have a frank conversation with employees about the piece-rate games we discussed in Chapter 9. Talking explicitly about these issues is beneficial. Most farm workers have experienced piece-rate cuts either directly or through someone they know well. For a piece rate to be properly designed requires trust and confidence on the part of the crew workers, that their interests are being protected. Without a doubt, nothing can kill worker motivation faster than having the piece rate lowered—or the fear of the same.

Using a test of fairness, we might design the piece-rate pay system pretending that we do not know what our role will be. Will we or a loved one come back to this job tomorrow as the farm owner, supervisor, or worker? Such an exercise will help us discover and repair design flaws and yield sustainable results that are good for the farm employer and the crew workers alike—in the long run.

Some decisions require a degree of boldness. Those who have watched the equestrian events at the Olympic Games

have noticed the coordination that is required between horse and rider to clear the jumps. The obstacles have to be taken without hesitation. Lack of unity between horse and rider—or not permitting the horse the right number of strides before a jump—can lead to potentially disastrous consequences, the most serious of which is lack of confidence or trust in each other.

Before the competition, riders spend considerable time and effort walking and studying the course. But when the time comes to ride, there can be no timidity. There are similarities in terms of piece-rate pay. There must be no tentativeness. Of course, an important difference is that while it is only the rider that walks through the course ahead of time, in establishing and maintaining piece rates both management and workers can look over the course, and work out the impending potential obstacles and difficulties jointly. Confidence and trust will build over time.

### **Walking into the Field, Orchard or Vineyard**

When paid by the hour, the fastest crew worker performs at the same speed of the slowest one. This can be easily observed when driving by a field or walking into an orchard. All the workers seem to be moving across a field or orchard together. When workers are moving very fast or running, or are well spread out through the field, it usually means that the piece-rate pay has been well designed—at least from the worker perspective. If workers are moving faster than by the hour but not as fast as in a motivating piece rate, it often means that workers are paid on a group piece-rate.

What does it mean when crew workers look as if they were paid by the hour, but are in reality paid by the piece? It signifies that the crew workers have not bought into the piece-rate plan. Four key reasons why farm workers may act as if they were paid by the hour—even when paid by the piece—include: (1) the piece rate is too low and they are hoping the employer will raise

it; (2) the piece-rate design is faulty (such as the infamous hourly pay plus piece-rate bonus or other types of incentives that do not reward effort); (3) there is not enough work (workers realize that if they hurry they will work themselves out of a job); and (4) mistrust that the piece rate will be reduced either now or in future years (when the employer sees what workers are capable of).

## HOURLY EFFORT AND PIECE RATE PAY

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Crew workers tell me that growers would like nothing more than (1) to have piece-rate paid employees slow down to an hourly speed and perform with the highest quality; and (2) when paid by the hour, have employees increase their productivity to match that of a piece-rate paid crew. In the previous chapter we introduced issues of speed vs. quality and here we will delve further into this topic.

### Hourly Pay plus Piece Rate Bonus

Man's creativity knows no bounds, but that is not always a good thing. Growers reason that if hourly pay yields better quality work and piece rate generates higher productivity, why not combine both and get the best of two worlds? When utilizing such an approach, nevertheless, growers end up inversely rewarding workers for their performance. In other words, the greater the worker productivity, the less the *pay received per effort* (i.e., per vine pruned, fruit tree thinned, box picked or pound processed). The faster workers, then, subsidize the slow ones. (By the way, this also happens when a grower has piece-rate paid workers who are not making the minimum wage.)

Few employers have done the math, and even fewer have designed such pay schemes on purpose to try and punish their best employees. Crew workers are dissatisfied with the hourly pay plus piece rate design, even though they might find it difficult to verbalize the exact reason for their discontent. I call it the perverse incentive.

At first, there may even be some employees who think this is a wonderful approach as the employer is guaranteeing them a certain base wage. With time, workers come to see the negative aspects of this incentive pay approach.

Over the years I have known numerous farm employers who have implemented an hourly pay plus piece rate bonus system. The long term results are disastrous.

In 2004 an endive grower-packer, Rich Collins of California Endive Farms, shared with me a letter he received from employees that essentially stated, "Please remove the burden from off our shoulders and change the way you pay." The letter was signed by all packing shed employees. In this packing shed, several teams of four women sort and pack the endives. Rich Collins kindly permitted me to share some of the details of his former pay system. The base pay back in 2004 was \$7.25 an hour for up to 75 pounds of produce handled per hour. The bonus was that of \$0.055 per pound for every pound over this 75 pound base (Table 10-1).

What may not be immediately evident in these numbers is that the pay per effort (pounds processed) *diminishes* with *increasing* performance levels, as we see in Figure 10-1.

Most farm workers do not need to pull out their calculators or computer spreadsheets to intuitively realize that added effort is not compensated evenly. A straight piece rate is much more motivating to workers (Figure 10-1).

The hourly pay plus piece rate bonus approach can also be compared to a straight piece rate. In Figure 10-2, we note that those processing 100 pounds per hour make double than those who process 50 pounds per hour (i.e., a 100% pay increase).

In the hourly plus piece rate scheme, however, those processing 100 pounds only get a 19% pay increase over those making 50 pounds per hour. Later in the chapter, we share how the California Endive Farms corrected their pay system as a result of the complaint.

Let us consider a different example, one based on strawberry trays picked

Pounds / hour	Base pay	Bonus pounds	Bonus	Base + Bonus	Pay for effort
20	\$7.25	0	\$0.00	\$7.25	\$0.36
25	\$7.25	0	\$0.00	\$7.25	\$0.29
30	\$7.25	0	\$0.00	\$7.25	\$0.24
35	\$7.25	0	\$0.00	\$7.25	\$0.21
40	\$7.25	0	\$0.00	\$7.25	\$0.18
45	\$7.25	0	\$0.00	\$7.25	\$0.16
50	\$7.25	0	\$0.00	\$7.25	\$0.15
55	\$7.25	0	\$0.00	\$7.25	\$0.13
60	\$7.25	0	\$0.00	\$7.25	\$0.12
65	\$7.25	0	\$0.00	\$7.25	\$0.11
70	\$7.25	0	\$0.00	\$7.25	\$0.10
75	\$7.25	0	\$0.00	\$7.25	\$0.10
80	\$7.25	5	\$0.28	\$7.53	\$0.09
85	\$7.25	10	\$0.55	\$7.80	\$0.09
90	\$7.25	15	\$0.83	\$8.08	\$0.09
95	\$7.25	20	\$1.10	\$8.35	\$0.09
100	\$7.25	25	\$1.38	\$8.63	\$0.09
105	\$7.25	30	\$1.65	\$8.90	\$0.08
110	\$7.25	35	\$1.93	\$9.18	\$0.08
115	\$7.25	40	\$2.20	\$9.45	\$0.08
120	\$7.25	45	\$2.48	\$9.73	\$0.08
125	\$7.25	50	\$2.75	\$10.00	\$0.08
130	\$7.25	55	\$3.03	\$10.28	\$0.08

TABLE 10-1

Workers who process 130 pounds per hour earn \$10.28 per hour in contrast to, say, someone earning \$7.25 and handling 50 pounds. What may not be immediately evident in these numbers is that the pay per effort (pounds processed) diminishes with increasing performance levels.

(Figure 10-3). In the hourly plus piece rate condition (blue line) workers have a guaranteed wage of \$6 per hour and make a dollar per tray after that. In the straight piece rate condition (red line) the crew workers earn \$2 per box. If they pick only one box, they earn \$2. The green arrow in the figure, around

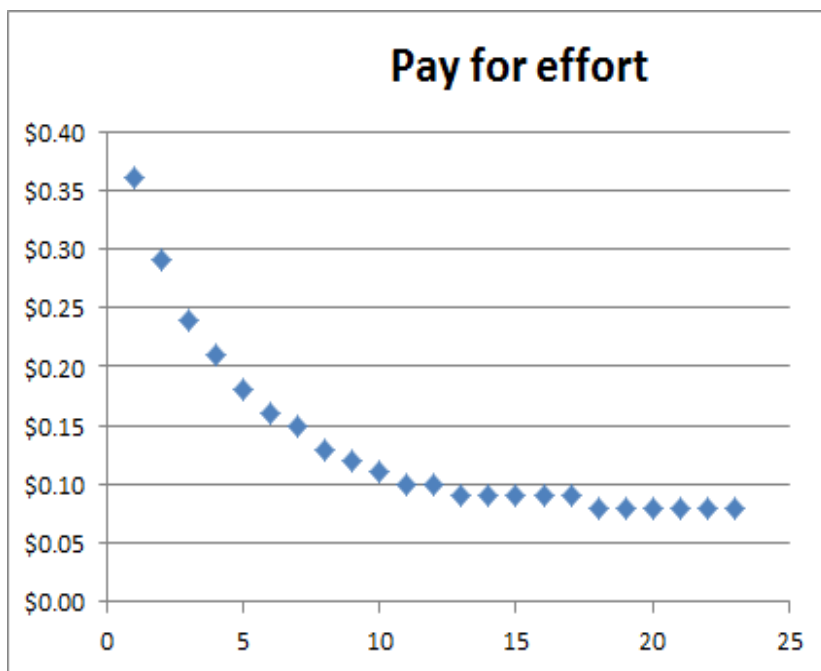
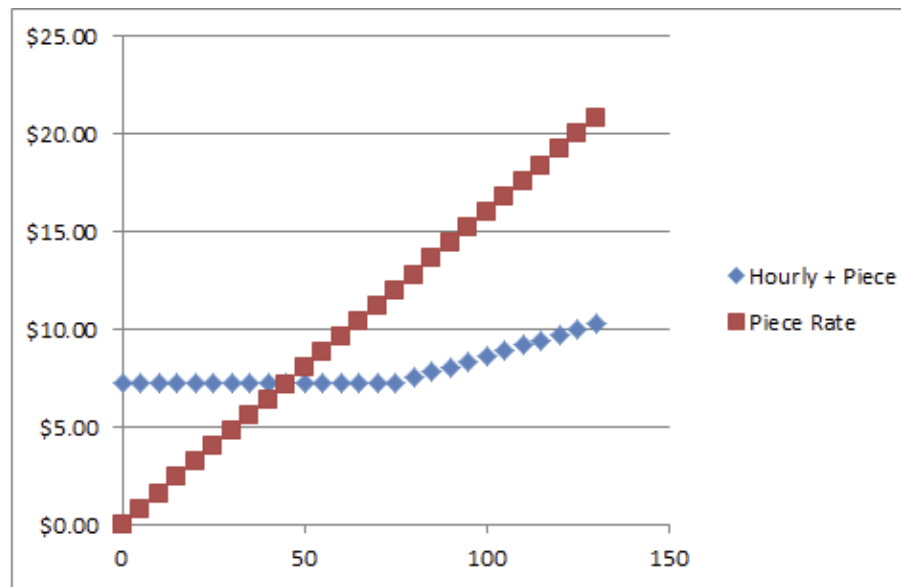


FIGURE 10-1

Dollars earned per effort (pound processed) shown in the Y axis, and pounds processed in the X axis. This is a graphic representation of the diminishing earnings per effort made. In other words, the harder a worker performs, the less she gets paid for her efforts.

FIGURE 10-2

Here we have the same data for hourly plus piece rate pay line (blue) as contrasted to a straight piece rate line (red). Several growers have correctly pointed out that similar problems exist when workers do not make the minimum wage and have to be subsidized by the grower—or by those faster crew workers.



the 7 box mark, shows the intersection between these two lines. Everyone to the right of the green arrow in the hourly pay plus piece rate scheme would have earned more if they had been working on a straight piece rate, while those on the left of the green arrow would have made less.

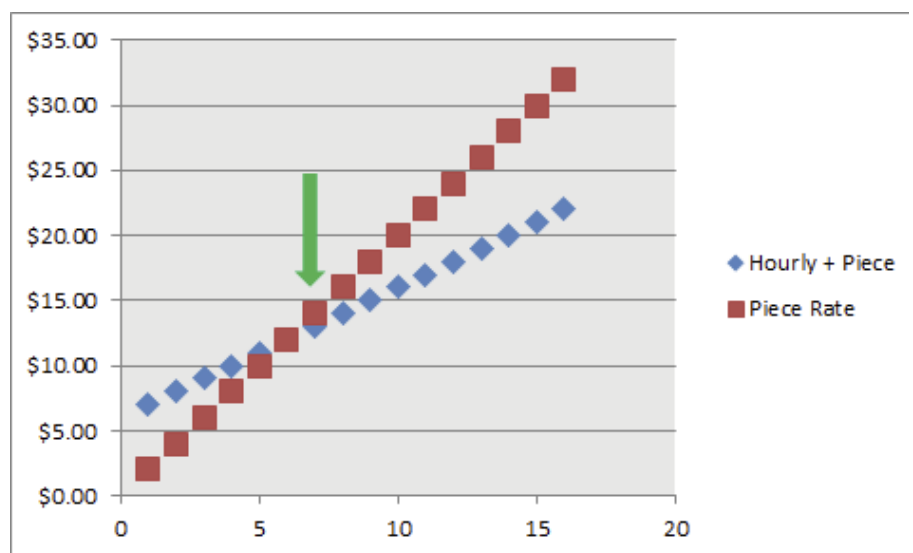
Yet another way to consider this same data is to note that everyone on the right of the green arrow is subsidizing the workers on the left. The employer is taking money, so to speak, from his fastest workers, to increase the pay of those who are less skilled or motivated.

Figures 10-1 and 10-4, then, show how the fastest workers are paid less for their efforts than the slowest ones. By the way, there is no need to provide yet a third figure with a pay for effort for hourly paid employees as it looks exactly the same as these two. No wonder the fastest crew workers work no faster than the slowest ones when paid on an hourly basis.

Some farm employers point out that indeed their fastest workers are always ahead of the slowest, even when paid by the hour. In reality there are a few workers who do like to get ahead of the

FIGURE 10-3

In contrast to a straight piece rate, in an hourly plus piece rate scheme the fastest strawberry workers (here those picking more than 7 boxes) subsidize the efforts of the slowest ones (picking less than 7 boxes).



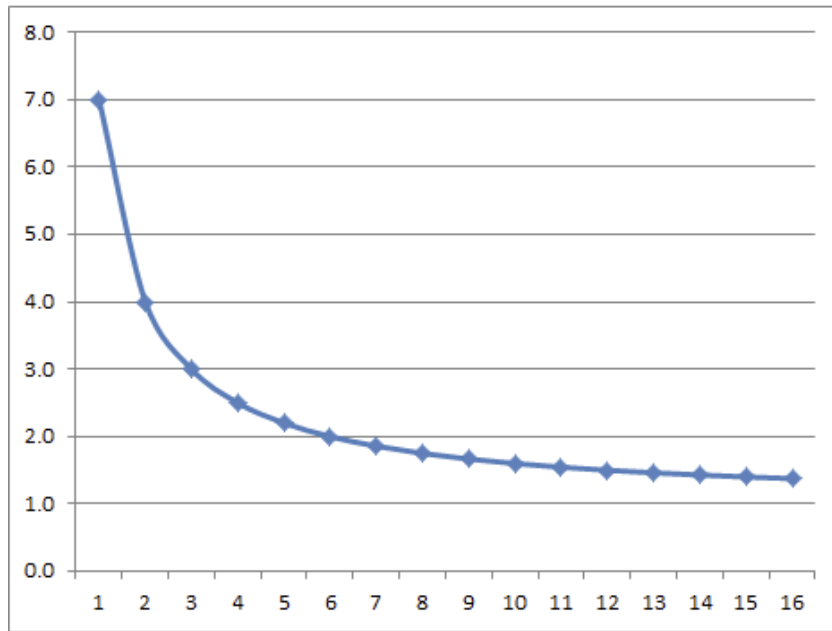


FIGURE 10-4

The *pay for effort* curve for these strawberry workers matches the one we already saw in Figure 10-1. For some years I have been calling the hourly wages plus piece rate pay the perverse piece rate as it rewards the slowest employees and punishes the fastest ones.

rest, but they generally only keep a small distance ahead.

### DIFFERENTIAL PIECE-RATE DESIGN

When growers see the numbers—and get the message about the detrimental effects of hourly pay plus a piece rate bonus—they often ask about *differential piece rate designs*. How about paying a straight piece rate up to minimum wage (or some such standard), followed by a greater piece rate after that (often called the Frederick W.

Taylor approach)? Or, how about a more refined tactic: a lower piece rate for the slow workers, an average piece rate for the average employee, and a high piece rate for the most productive ones (known as the Dwight Merrick method)? Would these differential piece rates not motivate worker performance in the right direction? Perhaps doubly encourage slow workers to step up to the plate and be more productive? In reality, this system also punishes employees. A grower regrettably credited a conversation we had on the hourly-pay plus piece rate faulty bonus as a trigger to implement a differential

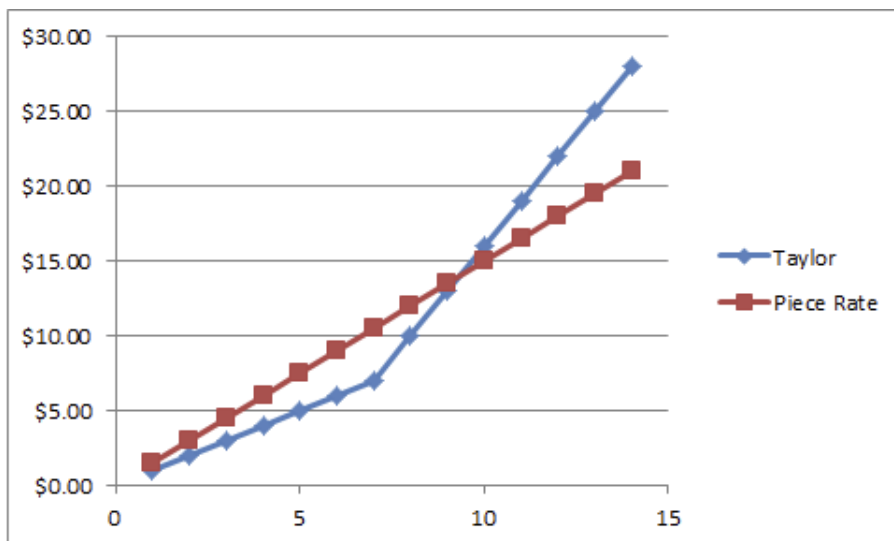


FIGURE 10-5

In contrast to the straight piece rate, the Taylor differential pay rewards fast workers more than slow ones. In this example, this is done after the 7<sup>th</sup> unit of work. It also punishes workers.



FIGURE 10–6

The *pay for effort* curve using the Taylor differential design. In this example, workers are paid at \$1/unit up to 7 units and \$3/unit thereafter. The pay per effort begins to steadily climb for each succeeding unit until it eventually tapers off below \$3/unit. This approach is unfair to both the slow workers who help support the pay for the fastest ones, as well as for all workers as they have to pay a sort of “work tax” in order to earn the highest pay levels.

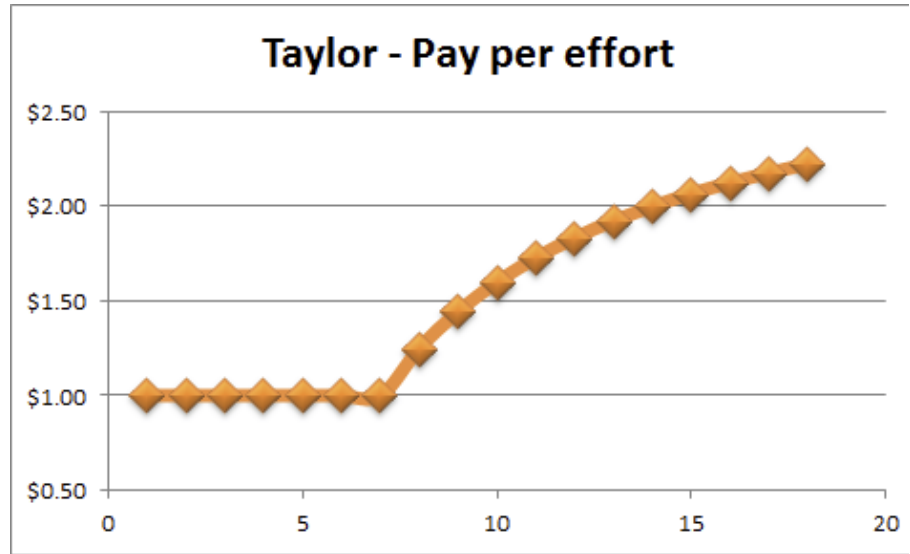


FIGURE 10–7

In contrast to the straight piece rate, the Merrick differential pay, just as the Taylor approach, rewards fast workers more than slow ones. Rather than just two rates, the Merrick differential has a different rate for the first few units, a higher one after that, and an even higher rate available to the fastest workers. Workers are also punished.

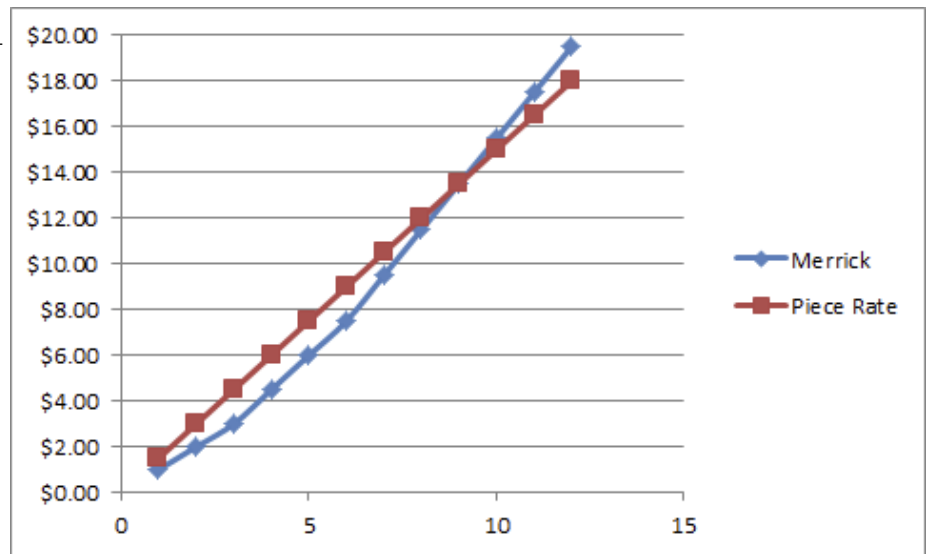
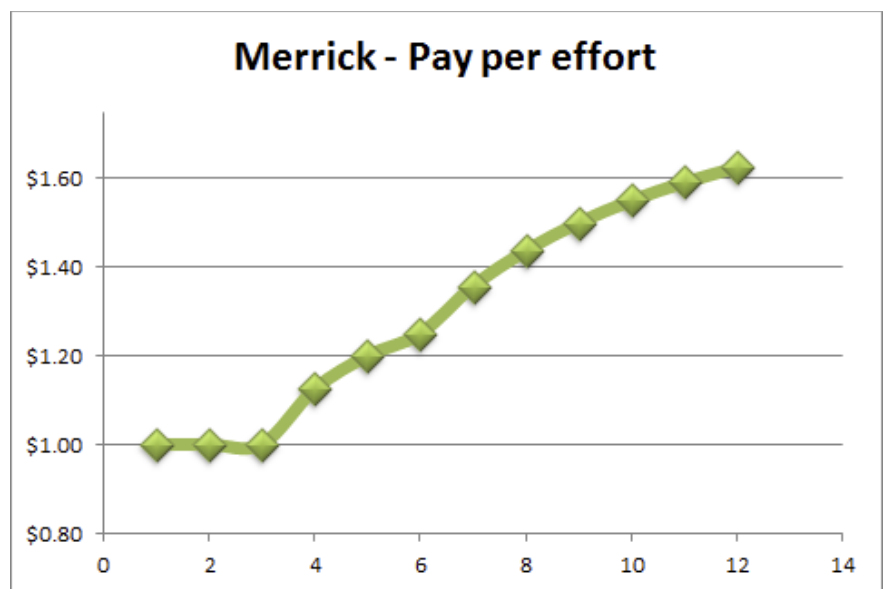


FIGURE 10–8

The *pay for effort* curve using the more sophisticated Merrick differential design. This approach is just as unfair to the slow workers as the Taylor method.





piece rate approach. I am grateful, once again, for this grower's willingness to have me share the details. He paid employees who were crushing and packing walnuts a straight piece rate until they reached the minimum wage—and a piece rate that was 33% higher for any production over that. This producer reported great success and happy employees who, said he, “thought it was only fair to get paid a little extra for the additional effort.” Thirty-five percent of the employees at the packing shed were making at least some amount of their earnings at the higher piece rate level.

Despite the workers initial enthusiasm, may I suggest that the differential piece rate—based on worker productivity—is also flawed? (This is not the case for some other types of variable piece rates, as we shall see, such as those based on achieving a quality goal, staying until the end of the season, or accounting for tasks that require different amounts of effort.)

Figure 10–5 shows the pay received by crew workers under the Taylor method in contrast to the straight piece rate. The faster workers in the Taylor differential design are clearly rewarded more than the slower ones. In Figure 10–6 we can see this same data in terms of pay per effort in the Taylor-style differential piece rate.

We have a \$1/unit piece rate up to 7 units. After that, the pay per unit goes up to \$4 per unit. Note that the departure from the \$1 / hour line is sharp and then the curve begins to taper off as it approaches \$2.50/ unit. Taylor's approach has a required trigger performance before individuals can begin earning the additional pay per unit. Here the slower workers are helping to pay for the bonuses earned by the fast ones. This is just as unfair as when the fast crew workers help pay for the slowest ones.

Figures 10–7 and 10–8 represent the Merrick differential piece rate. Here there are three different scales. In our example workers make \$1/unit up to 3 units. After that they make \$1.5/unit until they reach 6 units, after which they make \$2/unit. Note the same pattern of the curve lines tapering off as in the

Taylor approach. This refinement does nothing to make the system fairer for that slow worker. Once again, slower workers help pay for the bonus of the fast ones.

Besides the departures from a straight piece rate proposed by Taylor and Merrick, there are many others of a similar nature (e.g., Bedeaux, Emerson, Hayne, Rowan, Gantt, etc.). They either punish the slow worker or penalize the fast one. Any departure from a straight piece rate—other than to consider difficulty levels or to reward quality of work—is constructed on faulty foundations. (These comments are not intended to undervalue time-based incentive programs that assign pay to completion of unique tasks requiring widely different amounts of *effort*.)

A differential piece rate, if it did not lower worker morale, would only have a minor disadvantage for the employer. It is a little harder to calculate actual costs, in contrast to a straight piece rate. Worker morale, nevertheless, does suffer: (1) All workers, regardless of productivity level, are paid less for working up to the higher cutoff piece rate. Workers may come to feel that they are being taxed for the right to earn more; and (2) slow workers subsidize the wages of the most productive ones. This is the most fundamental defect of a differential piece rate. While the literature on differential piece rates often suggests that employees are motivated by this system to reach higher levels of productivity, it obscures the fact that great differences in ability exist among workers. Slow workers are simply not capable of performing at the speed of the fast ones. Gladly, David W. Belcher (1955) speaks against the unfair nature of the differential piece rate: “Perhaps these early selective plans are in part responsible for the widespread distaste for piecework.” (3) Simplicity and clarity is valued by employees, and these differential approaches are not as transparent as the straight piece rate.

To summarize, just because crew workers may not immediately know how to verbalize their dislike for a poorly designed piece rate system, it does not mean that they like it. Piece

rate designs where some workers subsidize the earnings of others are demoralizing to employees.

### PAID REST BREAKS.

One disadvantage of piece-rate pay is that most employees forego their breaks.<sup>18</sup> Making sure employees take their breaks is likely to reduce injuries and mistakes as well as increase worker preference for piece-rate paid work. While those who perform hourly paid tasks take breaks on the farmer's time, those on piece rate would have to do so on their own time. One way to encourage employees to take breaks when paid by the piece is to bring warm bread or cold juice out to the crews. Even more effective, is to insist that workers take a rest and pay them for the break time, either on an hourly basis or as a proportion of their piece-rate paid earnings. I generally suggest the former for longer breaks and the latter for shorter ones (i.e., 10 minute breaks). The advantage of the latter approach is that it rewards employees proportionately to their productivity.

I believe that paying for the piece-rate paid employee's rest period goes a long way to prove to the employees that you really do want them to earn more money (because it means you make more as well). As we have said repeatedly, most workers are weary of giving their best for fear that their wages will be cut either now or in the future. Paying for piece-rate breaks is now required in some locations.

### VARIABLE PAY FOR EFFORT

Piece rates should take into consideration the required effort. Many farm employers face a serious dilemma when they have uneven orchards or crops.

If they have crews begin with the easiest work, where workers can make the most amount of money, they know that these same crews will ask for additional pay as the difficulty increases. If they begin with the most difficult jobs, crews will seldom stay long

enough to experience some of the more rewarding blocks, where they can make more money.

The answer to this challenge is to have variable wages tied to job difficulty. For instance, young vineyards tend to be easier to prune than those that are a bit older. Some orchard varieties offer more pruning challenges than others. Some years fruit trees or vines are more loaded with crops than others. While having a different pay level for every variation can become confusing and unwieldy to manage, establishing a few different rates is easily understood and well accepted by employees, once this has been explained.

The producer first determines what the ideal conditions are for the work involved. For instance, during harvest the ideal conditions for the picker are plants loaded with vegetables, berries, or fruit. Such a loose definition needs to be translated into a specific minimum number of pounds per feet, per tree, etc. I call this the 100% point, and this needs to be the basic piece rate.

When there are fewer fruit to pick the piece rate is increased by an equivalent percentage. At some points it may be 120%, 150% or more than double.

The idea is that the workers are neither rewarded or punished by the difficulty of the job. Workers generally do not control fruit density any more than they control profits.

Some pickers will consistently outperform others. For any given picker, for instance, equivalence in effort should result in uniform pay, regardless of whether the plant is loaded or almost barren.

Effort in other types of piece-rate work such as thinning, pruning and other tasks can likewise be rated in terms of difficulty and paid accordingly.

### GOOD YEARS / BAD YEARS

Closely related to the issue of effort has to do with good vs. bad years. One of the realities of agriculture is the fact that there are good and bad years. Also, crew workers do not control the market price for crops or specific varieties. It is

the employer who takes the full risk in planting any given crop. Workers, once again, should not be rewarded or punished because of fluctuations in the market value for these. Instead, employees need to be rewarded for their productivity and the effort required.

Part of managing any type of incentive, including piece rate, is for the employer to realize that some of the money from good years—that on the surface appears to be profit—needs to be set aside to fill in the holes created by bad years.

There are circumstances when a farm employer may pay more than what the effort seems to call for. Two examples include: (1) the grower has a cherry or raspberry crop that will be ruined if it is not harvested before an impending rain; and (2) a crop will lose value in the market for every day that it is not harvested. During such circumstances a farm employer may need to pay more than merely on a worker skill and effort basis. Under these circumstances the farm employer pays more by sharing with the crew workers a greater percentage of the crop value in order to either avoid losing the crop altogether or maximizing its market value. Such extra pay may be applied as either added hours of work (e.g., overtime) or an increased workforce. Workers need to understand the reason for the pay increase.

## ANALYSIS OF VARIANCE

We have already mentioned ANOVAs (Analysis of Variance) as an excellent statistical tool to gauge employee motivation. If employees are well motivated and there exists a typical variability (in other words, the employer has permitted the slower employees to stay and the faster employees have stayed because they feel satisfied that their efforts are yielding positive results, then the ANOVA will be statistically significant for worker variability.

In our first example ( $p < 0.001$ ), Figure 10–9 gives us a graphic representation through a boxplot figure of vineyard pruners. Beside the highly significant statistic, we know the workers are motivated from a visual inspection, because some workers are more productive than others, and because the boxplots are relatively tight (i.e., boxes are short rather than tall, generally showing consistency in worker performance).

In Figure 10–10 (using the same data for motivated workers as in Figure 10–9), we look at performance variability between days ( $p < 0.05$ ). We see that some days workers did perform a little better than in others.

In our second example where we use the ANOVA we again will contrast worker variability (apple pickers) and

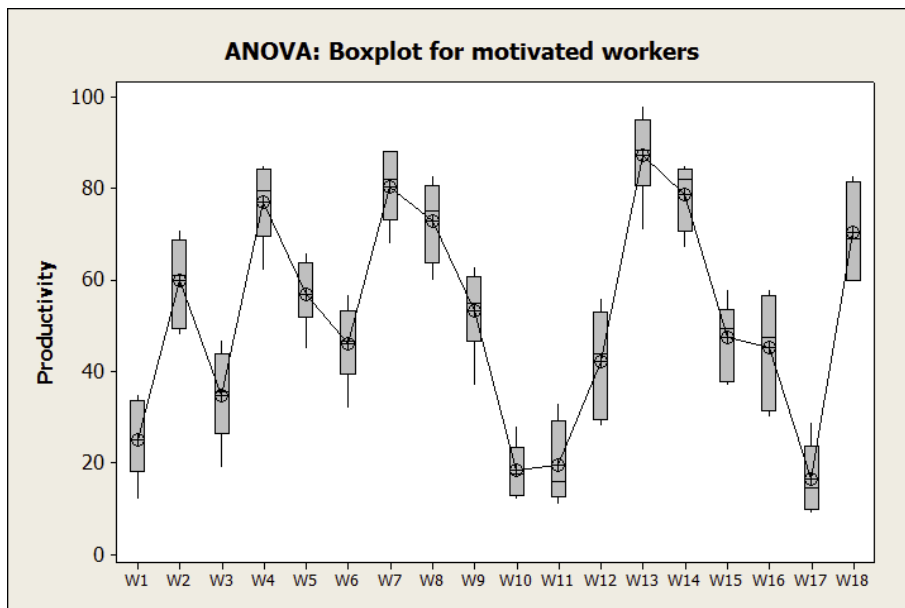


FIGURE 10–9

Boxplot showing motivated crew workers. We can ascertain motivation through visual inspection: some workers are more productive than others; and boxes are relatively tight. Workers 12 and 18 (W12, W18) show a bit less consistency than most of their colleagues, however.

FIGURE 10–10

Boxplot showing variance between days among our motivated crew workers from Figure 10–9. We can ascertain that there are some differences in performance among days ( $p < 0.05$ ).

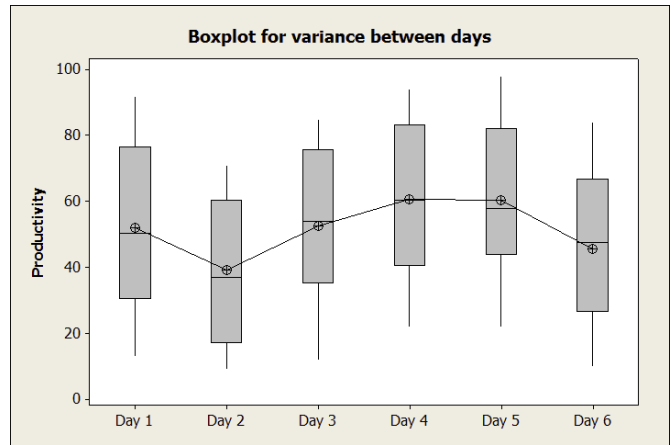


FIGURE 10–11

Boxplot showing apple crew workers that are not motivated. We can ascertain the lack of motivation through visual inspection and lack of consistency of most pickers in this crew. As we compare these to Figure 10–9, we can see that many boxes are tall rather than tight. Several workers overlap with most other workers, also. Such overlap also shows lack of consistent variation between crew workers.

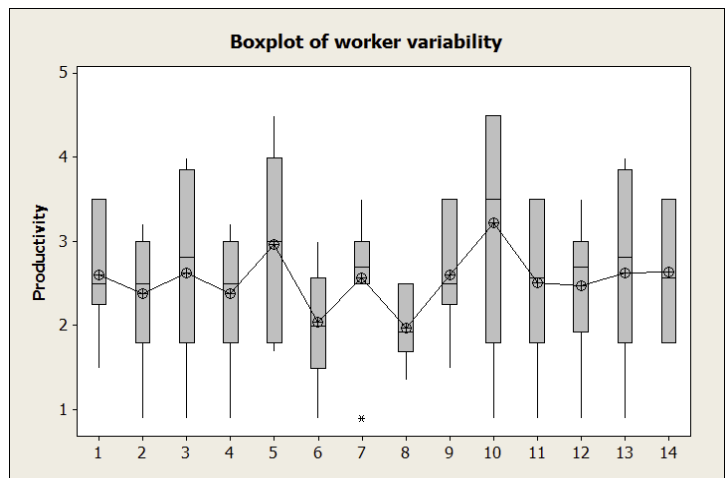
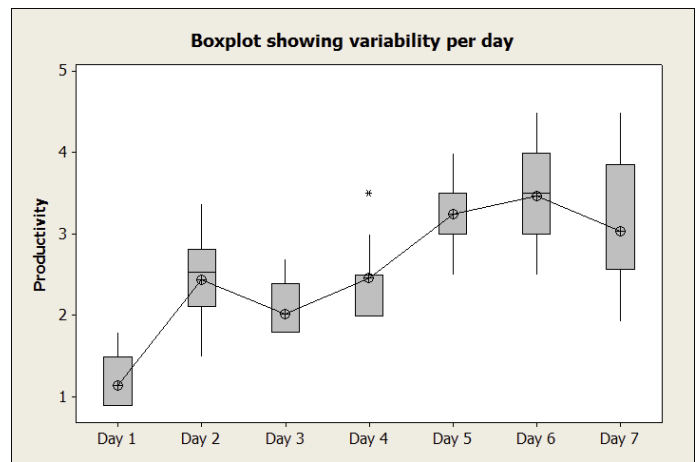


FIGURE 10–12

Boxplot showing great variability in performance between days (data from the same apple orchard from Figure 10–11).



variability per day. Figure 10–11 shows that indeed the workers are not motivated as there is very little consistent variation between pickers ( $p = 0.6$ , no statistical significance). The performance of several of the pickers overlaps with those of others. This is in contrast, also, to Figure 10–12, where

we examine variability between days worked ( $p < 0.001$ ). We can see that these apple pickers are moving in a relatively uniform fashion across the orchard, then, and that some days they are more productive than others, on the whole.

## CASE STUDY: ENDIVE PACKING SHED

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We now return to the California Endive Farms packing shed mentioned above. This section is based on a study conducted by Celina Lemus, Production Manager at the California Endive Farms, and me.

The endive plants are first grown in the field, harvested and stored for up to eleven months and the delicate root is then placed in a completely dark room with just the right temperature and humidity. Small variations in temperature and humidity can have serious adverse effects on the process.

As we said, while more productive employees were going home with additional pay per hour, the pay system penalized them. These faster workers were paid less per pound than slower ones.

After the complaints from the packing shed personnel, the management team (including Rich Collins, Howard Hofmann and Celina

Lemus) met with me in 2004 and discussed the basics of a properly designed incentive pay system.

Four of the most vital principles include: (1) protecting employees from piece-rate games played by management; (2) protecting management from poor quality work and activities that benefit employees at the expense of the farm enterprise; (3) designing a pay for performance approach that rewards employees for their effort, or what is under their control; and (4) involving workers in the decision-making process (Chapter 9).

Some of the endive roots that employees handle take considerably less effort to trim and pack than others. As a result, a multi-tier approach was designed. The best quality endives would be paid at 8 cents per pound. Those endives that would require more work were to be paid at either 9 or 10 cents per pound. The goal of the field and storehouse managers was to produce as much of the top quality endive as possible.

*Some of the endive roots that employees handle take considerably less effort to trim and pack than others. As a result, a multi-tier approach was designed.*

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For roots that did not meet any of these three quality grades, work would be done by the hour at the standard \$7.50 per hour wage at the time. (Beside the white endives, at that time red and organic endives were paid by the hour. Today all pick/pack work is by the piece.)

In 2013, depending on the quality of the endives, wages ranged from 9.3 to 11.6 cents per pound. As a result of a successful conversion to a straight piece rate, employees were now earning much higher wages. On a sample date in 2013, for instance, the lowest performing group earned \$18.45 per-person-per-hour, and the highest, \$22.54 (pre-tax).

But let us return to 2004 for a moment. When management was satisfied with what seemed as a workable plan, about twenty percent of the most outspoken packers were invited to hear the proposed changes, and more importantly, raise concerns and offer their own suggestions. After corrections and adjustments were made, the plan was implemented February 2005.

Because Celina Lemus had kept excellent data from the time she began her job, data was available to be analyzed beginning with September 2002. This would permit careful before-and-after measures and trend comparisons for over a decade (547 weeks or 10 ½ years).

### **Employee Reaction**

There were no formal satisfaction surveys taken to compare before and after results. We have, however, other measures that can act as proxy for changes in worker satisfaction.

*Before the change.* We reference the previously cited letter to show how dissatisfied the 40 women must have been in order to write and sign such a bold message to management asking for changes. Not only was there a problem with the wages (despite their productivity, wages never surpassed double the minimum wage), but they also were frequently required to work overtime during the week or Saturdays in order to meet demand for endives.

*Transition period.* Changes in pay are often met with much suspicion. It is not surprising, then, that packing shed employees would be distrustful about such a drastic change in pay. Feelings of distrust loomed large during the transition period which was characterized by continual complaints, anxiety on the part of the employees, and sabotage of the new system (for a month some of the women decided to work at the same pace to prove the system wrong).

*Complaints about low earnings.* Employees felt they were earning less than in the hourly plus piece-rate pay period until management showed them the opposite with payroll data.

*Complaints about overtime.* Before the pay change, management was forced to make overtime mandatory with disciplinary actions for non-compliance. With the change to the new system, the women complained because they felt they were going to earn less without the overtime.

*Complaints about teams.* It is important to have employees choose their own teams when working under a team piece-rate. Management now received multiple complaints from teams about members who were not pulling their weight. The packers pleaded for the issue to be resolved without it being known who had complained. Even when individuals were permitted to ask for changes through anonymous ballots, less than a handful did so.

Equality seemed to be a more salient need among the all-female packing crew than maximizing earnings. Complaints about poor performing teammates continued to be raised privately, however. Rich Collins announced that he would choose new teams. This was a risky but necessary move. Packers with high absenteeism rates were grouped together, as were others with similar working characteristics—including top producers.

Individuals voiced their unhappiness at being forced to change teams but complied. The differences between teams in terms of productivity and salary were at first quite substantial, and along a traditional bell curve.

Multiple Regression Analysis (n = 547 weeks)				
Regression Equation: Pounds / hour = 1.16 + 0.62 Pounds / tray + 14.94 New machine + 65.54 Straight piece-rate pay				
Coefficient Term	Coefficient	SE Coefficient	T	P
Constant	1.16	5.04	0.23	0.817
Pounds / tray	0.62	0.04	15.23	< 0.001
New machine	14.94	4.44	3.36	< 0.001
Piece rate	65.54	4.04	16.23	< 0.001

FIGURE 10–13

Multiple regression table shows very high t-test scores for both pounds/tray and for piece-rate pay. Multiple regression shows that all the independent variables are highly statistically significant at the  $p > 0.001$  level.

One day, not long after the new piece rate system was instituted, the women almost walked out. Management had been returning poor quality work for repackaging. Workers had to be begged to stay. For some time complaining continued and in fact some individuals did leave but generally regretted their decision.

Before the new piece rate system the women would stretch their 15 minute breaks to 20 or 25 minutes. After, machinery had to be stopped to force individuals to take their break.

*Established change.* By 2006 the packers were pleased with working

conditions and from time to time informally approached management to let them know that things were much better. That they could make more money in less hours and that they could spend more time with their families. In fact, employees were so satisfied with their jobs that there was virtually no turnover.

By February 2006, tensions were again building and management received requests for additional changes in teams. By this time all employees had bought into the new system and were very aware of their earning potential. All pick/pack employees were allowed to

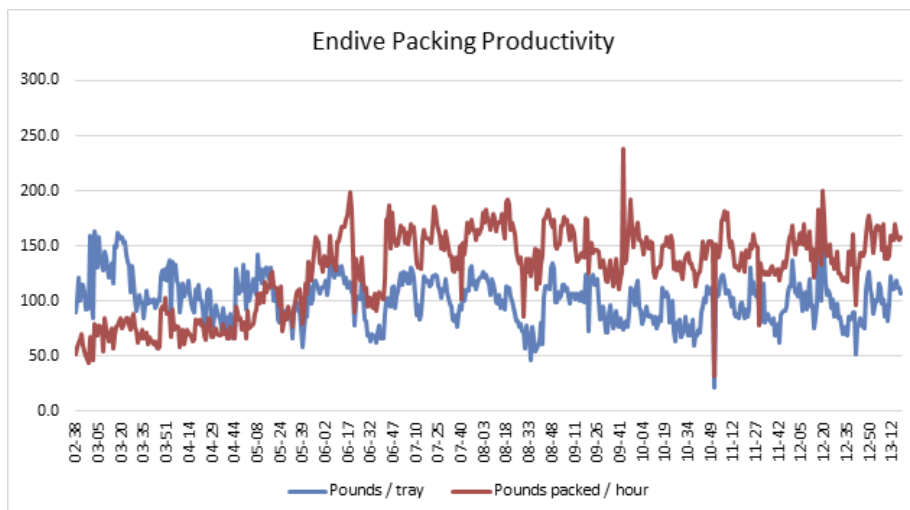


FIGURE 10–14

Endive packing productivity shows how pounds-packed-per-hour (red line) has increased over the years, compared to the pounds/tray (blue line).



FIGURE 10–15

Graph shows average pay per hour for week 4 (picked randomly) from 2002 to 2013. We can observe the change in pay associated with the change in the packing shed compensation.



choose new teams. At least one person per team took advantage of this second opportunity to change. In order to lower disruptions and permit changes, it was decided to provide for packer-selected changes every six months. The women have completely taken ownership of these changes.

*Other benefits.* In addition, management pays the women for ergonomic exercise time and time to regularly discuss issues of concern to employees and packing shed. There is less horseplay and more focus on the job, and as a result a better safety record.

### Statistical Analyses

Data was collected from week 38 of 2002. Productivity enhancement machinery was introduced into the packing shed during week 34 of 2004. The new straight piece-rate pay approach was introduced week 6 of 2005. We conducted a multiple regression analyses (Figure 10–13) for *pounds packed per hour* as our dependent variable and measured it against three independent variables: (1) *pounds/tray processed* (the higher this figure, the higher the quality of the endives); (2) introduction of *productivity enhancing machinery*; and (3) introduction of the *straight piece-rate* approach. The machinery made a small difference in productivity, and it is possible that this was also confounded

with other improvements introduced by Celina Lemus.

Figure 10–14 shows that even great increases in pounds/tray—as vital as this factor was—did not have a great effect on worker productivity until after the introduction of the straight piece-rate approach. Statistical analysis shows that both the piece-rate pay and the pounds/tray had the strongest effect on the dependent variable, worker productivity (pounds per hour).

A quick glance at 10–14 visually shows that something important happened in February 2006 and even greater changes took place after that. We also see some major drops in productivity associated with periods of very poor endive quality. One of these periods of low endive quality appeared early on in the study. We can see that increases in productivity (other than the great dips in endive quality) have been sustained since week 49 of 2005 through 2013.

### Return on Investment

We took a conservative approach in terms of return on investment (ROI) calculations in terms of the (1) actual benefits and costs, (2) not translating all benefits into monetary values, and (3) calculating benefits for a single year rather than long-term (as recommended by Phillips and Phillips, *The Consultant's Scorecard*, 2011). The ROI was calculated using 2013 costs and

wages and averaging costs and benefits over the length of the study. We have purposely obscured some of the numbers for privacy purposes.

We obtained a 254% ROI with a benefit/cost ratio of 2.5:1, that is, for every \$1 invested, the packing shed gained \$2.5. (If instead we calculated the ROI over the eight year period it would be 490% with a 4.9:1 benefit cost ratio. It is somewhat artificial to limit the benefits to the packing shed to one year.

*I. Costs: \$45,719*

1. Mileage and meals to consult with me = \$119
2. Combined management salaries for time spent with me and preparing for change = \$4,600
3. Additional payroll expenses = \$11,000 (a new payroll program permitted a great decrease in this cost half way through the program)
4. Additional labor to wash trays and keep up with the increased productivity = \$25,000.
5. Consulting fees (not charged but included for realism) = \$5,000

*II. Benefits: \$161,875*

1. \$71,875 worth of yearly increased productivity
2. \$47,500 overtime savings
3. \$40,000 in reduced costs surrounding turnover (turnover was completely eliminated)
4. \$2,500 in uniform and supply savings.
5. A second shift was seriously considered. Costs associated with these changes include labor, electricity, forklift, etc.
6. Elimination of lost sale opportunities.
7. Greater predictability of output in filling orders
8. Reduced wastage in quality of product that had to sit around because of poor predictability
9. Ability to correctly apply the principles to other types of endives over time and eliminate all hourly work.
10. As we have already stated, increased worker satisfaction and reduced labor-management tensions as well as an improved safety record.

*The straight piece rate approach worked so well that in time both white and red endives were packed using piece rate.*



ROI =  $\frac{\{(\text{Total benefits } \$161,875) - (\text{Total costs } \$45,719)\}}{(\text{Total costs } \$45,719)} * 100 = \frac{\{(\$161,875 - \$45,719)\}}{\$45,719} * 100 = 254\%$   
 (with a Benefit / cost ratio 2.5:1 or for every \$1 invested, gain of \$2.5).

### Productivity changes

Before February 2005, endives processed seldom surpassed 90 pounds per person-hour. It was thought by management that a barrier of 120 pounds per hour could not be broken. Yet, within a few months this barrier was shattered (10–14).

A serious dip took place from June through October 2005, months notorious for endives that are poorer in quality. A new peak was reached in April 2006, of an unheard of 170 pounds per hour. Unfortunately, 2006 turned out to be one of the most stressful in terms of endive production, with the quality of the roots hitting rock bottom.

I warned management about the dangers of having too many employees. As it turned out, early on, employees were able to do most of the work in a few piece-rate paid hours and then had to go back to hourly work. Correcting this problem took a number of years. At one point Rich Collins offered the women a golden parachute in order to hopefully entice a few to leave and thus have more piece-rate paid hours available for those who stayed. Only one employee signed on, an individual who was going to quit anyway.

The farm enterprise has permitted a gradual attrition rather than letting employees go in order to reduce employee numbers, thus preserving employee morale in this matter.

Management committed themselves not to replace positions as employees left (either maternity leave, other leaves including vacation or even permanent departures). When absolutely necessary temporary employees were to be hired and dismissed when the position was no longer necessary. Over time, the crew was reduced to 23 employees.

*Worker earnings* (Figure 10–15). Worker earnings before the February 2005 change in pay system was seldom

over \$10 no matter how good the endive quality (in other words, even the best employees were not able to double the minimum wage).

Endive quality was so poor in June 2006 that employees had to work a substantial number of days on an hourly basis. Even when piece rate work was available, these roots were processed so quickly that employees were soon back to their hourly work. So it was that having too many employees and not enough piece-rate work compounded the problem. One well known incentive pay principle is that workers will not put forth their best efforts when doing so means that they will drastically reduce their hours worked to the point where they would earn less money.

Endive quality did return to normal and over time, the farm enterprise managed to reduce the total number of hours worked so drastically that there was a huge reduction in overtime paid hours.

This endive packing shed gave a raise to the employees early on after the new system was established—and others since—to give the signal that increased productivity would be rewarded rather than punished. The California Endive Farms is committed to these increases over time even though the recession has strongly affected the industry.

Employees also receive fruit on a daily basis year-round and on occasion other special gifts are provided to them by the enterprise.

Specific recommendations I offer to this packing shed for additional improvements include: (1) incorporate a formal quality control system (Chapter 11) to go along with the piece rate; (2) continue efforts to keep communication open between employees and management; (3) continue to increase the pay per pound over time (to keep up with inflation), so that employees are kept whole in terms of pay per effort; (4) as additional employees leave, consider the possibility that the present crew can do the work without hiring additional personnel; and (5) when it becomes necessary to hire new pick/pack employees, use job sample testing

*Paying crew workers based on the effort required is the foundation for effective piece-rate pay.*

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(Chapters 2 and 3) to hire individuals who are capable of high productivity.

## SUMMARY

Piece rate, when carefully designed, has the potential to help both employer and farm worker maximize profits. The great news is that an effectively designed piece rate pay system is sustainable as it benefits both employer and employee in the long run.

In this chapter we argued for the importance of paying individuals based on effort rather than other variables. We analyzed several pay systems that have been tried in order to combine the best in hourly pay and the best in piece-rate pay but we find that all of these approaches punish employees. I call the hourly plus piece rate scheme the perverse piece-rate because it rewards the slowest employees and punishes the fastest ones. We also argued for the importance of paying for breaks in a piece-rate pay system.

We used the ANOVA as a statistic to study if workers are truly motivated or not. Finally, we shared a case study that showed the successful transition between the perverse incentive and a straight piece rate.

In the next chapter we consider a vital problem that caused many of the problems we experience with piece rate: how do we control for quality when paying piece rate or other types of incentives?

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