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**Private Sales and Public Information: Does the USDA's *National Berry Report*  
Provide Information on the Relationship between the Spot Market and  
Precommitted Sales?**

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Coordination up and down the marketing channel is becoming increasingly important in U.S. agriculture. Consumer preferences increasingly affect production practices and shipping activities, as retailers focus more on selling value-added products such as prepackaged salads. Value-added retail sales typically require coordination among the retailer, shipper, grower, and others in the product marketing channel in order to capture and utilize retailer information regarding consumer preferences. Often this coordination takes the form of formal or informal contracts between the retailer and its supplier.

The growth in the use of marketing contracts raises issues regarding price formation outside of traditional spot markets, and the consequences of such contracts for agricultural producers, retailers and others in the marketing chain. One marketing issue concerns the value of market information traditionally collected by the USDA. As the share of a commodity exchanged on a spot market declines, does this market information become less useful? How do increased nonspot sales affect relative returns to market participants? This *AIC Issues Brief* addresses these two questions in the context of the California strawberry industry.

In the fresh strawberry industry a substantial portion of the harvest is presold through an option called a precommitment between shippers and retailers. Using data from the USDA *National Berry Report*, we analyze whether precommitments raise mean spot prices by facilitating promotions and removing volume from the spot market or, alternatively, lower mean spot prices because precommitments do not create additional sales. We also investigate whether precommitments stabilize spot prices by facilitating the flow of strawberries when weekly harvests are large or, alternatively, destabilize spot prices by reducing the volume of strawberries sold on the spot market.

### **California strawberry industry**

Strawberries are the seventh most important crop produced in California, with sales of more than \$990 million in 2003. Strawberries are perhaps the archetypical agricultural produce: harvest volumes vary by season and depend heavily upon weather conditions, while the postharvest product is extremely perishable. Thus, timing is vitally important for the marketing of fresh strawberries, since there is a very limited window for harvesting and consuming the product. The California industry includes roughly 400 growers and 60 shippers. Shipping is highly concentrated, with the five or six largest shippers marketing over three-quarters of the annual harvest.

Each grower generally markets all of his or her fresh production through a single shipper each year. The shipper charges a per-unit fee for marketing services, including cooling and palletizing. Revenues from sales are pooled for a specified period, usually a week, and growers are compensated based on their deliveries to the pool. Shippers market strawberries to terminal markets, wholesalers and retailers. The terminal market share of total fresh volume has declined significantly over the last 30 years. Retailers are increasingly dealing directly with shippers rather than relying on brokers or terminal markets for their strawberry supplies. This growth in direct shipper to retailer sales has been accompanied by the development and increased use of precommitment sales, a type of contracting mechanism.

### **Precommitments in California strawberries**

Precommitments between strawberry shippers and retailers allow both parties to reduce volume uncertainty. Retailers such as Vons or Safeway, promoting a sale on fresh strawberries, must commit to newspaper advertisements (both space and content) around three to four weeks in

advance. Retailers will typically enter into precommitment agreements with shippers (and some brokers) to assure the volume of strawberries necessary to support their promotional efforts. Shippers generally do not know for certain the available volume three to four weeks before delivery because of weather variability and other random factors. Nevertheless, the shipper will enter into the agreement because doing so secures a buyer in advance for a portion of a very perishable product.

The precommitment agreement typically involves deciding on a maximum contract price (so retailers obtain an indication of their cost and shippers an idea of their revenue) or “lid price,” the volume to be delivered, and possibly such details as marketing services provided and quality considerations. A notable feature about these agreements is that they are not legally binding on either party. Market conditions at the time of delivery allow either buyer or shipper the opportunity to renegotiate the agreement. If the market is in short supply, the shipper typically only fulfills a portion of all his contracts. If the market is in over-supply and the spot price is substantially below the contracted price, retailers may ask for an adjustment in the contract price. The extreme perishability of strawberries gives the retailer leverage over shippers to renegotiate the price.

Shippers, as the marketing agent for growers, ultimately determine the distribution of realized harvest volume between spot market and precommitment sales. The volume sold on the spot market is the residual of the realized harvest volume and the volume precommitted to the retailer four weeks prior. Thus, spot market prices and price volatility are, to a varying degree, influenced by aggregate shipper decisions regarding precommitment sales.

The impact of the relationship between shipper precommitment decisions and the spot market price is not well understood. Marketing a greater share of strawberries through precommitments may increase the average spot market price if precommitments are associated with demand-increasing promotions. On the other hand, if precommitments simply replace spot market sales, then the average spot price will remain the same or perhaps fall. In this case the average price received by growers will remain the same or decline because the precommitment price is no higher than the spot price. In practice the average price received would decline because the precommitment lid price replaces the spot price whenever the spot price is higher than expected.

Precommitments may also affect spot market volatility. Some industry participants believe that precommitments have made the market less volatile, but cannot cite any evidence to support this. Precommitments may stabilize the market by reducing the average price paid when the spot price is high relative to its expectation and by facilitating the flow of strawberries when large volumes are anticipated. In the latter case, because strawberries are extremely perishable, shippers want to lock in buyers for some share of their product when the demand for strawberries is relatively low. However, an increase in the share of precommitments may create a volatile spot market because of the small volume of transactions.

### **Data analysis**

It is difficult to directly examine the overall market effect of precommitment agreements. Because such agreements are private, informal arrangements, there is no public record of quantities and prices. Rather than seeking to collect private data, we used public data from the USDA’s *National Berry Report*. Although it does not systematically report precommitment quantities and prices, it does sometimes include information on precommitments.

The *National Berry Report* publishes spot prices by production region. In addition, each report may include market supply and demand condition comments regarding berry quality, precommitment prices and volumes, and other factors. A USDA Market Services reporter obtains

this information by contacting shippers in each production district and compiling their statements into the report. This data is the most accurate public record of behavior of the strawberry market. We analyzed *National Berry Report* prices for medium- to large-sized fruit shipped in 12, 1-pint flat packages, which accounted for most deliveries during the period analyzed (January 1995 to November 2002). We analyzed data for four production districts: Salinas-Watsonville, Santa Maria, South District (Oxnard, Orange, San Diego counties), and Central Florida. California accounts for more than 80 percent of the U.S. fresh strawberry production, and Florida accounts for more than 10 percent.

During the period analyzed, the *National Berry Report* contained a number of market condition statements regarding precommitments. For example, *precommitments lower* was a common comment used to describe a situation where the precommitted prices were lower than the daily high-low price range. Other comments referred to precommitment sales but did not explicitly say so. For example, *some booked with prices to be established later* was used to describe a situation where shippers and retailers had set aside a certain strawberry volume to transact, but the price was not determined until a later date. Our analysis focused on two comments which provided precommitment prices that could be compared to spot prices: *Precommitments \$\_\_\_ - \$\_\_\_* was used when a price range could be determined from shipper reports. It is a relatively common comment. We used the arithmetic mean of the range for our analysis. *Precommitments as low as \$\_\_\_*: was used to report only the lowest reported precommitment price. Sometimes the “as low as” part was not said explicitly, and only a price was given. It was the most frequent comment regarding precommitments.

Table 1 reports average spot and precommitment prices for each region for the years 1995–2002, as well as the number of observations. The average spot price refers to the average nominal spot price for medium to large fruit by region. Notice that some year-region pairs have a relatively small number of observations compared to other years for that region. This variation in observations is due to differences in fruit sizes. In 1997, for example, South District marketed mostly large fruit in January-March, rather than medium to large fruit. The spot price information displays the general pattern that prices are higher for Central Florida and the California South District, which harvest early in the season, than for Santa Maria and Watsonville, which produce later in the season.

Table 1 includes average precommitment prices by region and year. In most cases, the average precommitment price was below the average spot price. However, in Santa Maria the two were essentially the same; the average annual precommitment price was 102 percent of the average annual spot price and ranged from 130 percent in 2000 to 79 percent in 1995. In Watsonville the annual average precommitment price was 92 percent of the annual average spot price across all years and ranged from 141 percent in 1997 to 75 percent in 1995. In the South District the average ratio was 87 percent, due to zero precommitment observations in 1999. Excluding that year the ratio was 99 percent, exhibiting the same pattern as Santa Maria. The highest ratio was 119 percent in 1998, and the lowest nonzero ratio was 75 percent in 2000. Central Florida’s average ratio was 79 percent, with a minimum of 63 percent in 2000 and a maximum of 97 percent in 1997.

The annual average precommitment-spot price ratios are affected by the magnitude of the supply shock, the elasticity of demand, and the nature of the precommitment observations. Precommitment prices were only reported when the precommitment price was lower than the spot price, which is consistent with a negative supply shock. The ratio will decrease as the difference between the expected spot price, as reflected in the precommitment price, and the realized spot price increases. A larger price difference for a given elasticity of demand would be associated with

a more severe supply reduction. Alternatively, given the size of the negative supply shock, a larger price difference would be associated with a less elastic demand. This suggests that regions that produce early in the season, when demand is less elastic, should have lower price ratios. This prediction is consistent with the relatively low price ratios for Central Florida and the California South District.

Second, the average ratio will be affected by the time of season when precommitment prices are reported and unexpectedly high spot prices are observed. In the South District, for example, prices tend to decrease over the course of the harvest season. If weather shocks occur early in the season both the average precommitment price and the average spot price will be higher than if the shocks occur late in the season. Of course, the net effect on the ratio will depend on the relative differences in magnitudes.

Precommitment prices were reported most often for the Central Florida District. Although the general pattern of precommitments would lead us to predict that South District would have more reported precommitment prices than the other California regions, this did not prove to be the case. On average, 16 percent of the South District's spot price observations were paired with a precommitment price observation. The corresponding numbers for Santa Maria and Watsonville were 17 percent and 24 percent, respectively. Perhaps this report pattern was due to differences in fruit sizes, which determined our dataset.

Analyzing averages conceals some information regarding the role of precommitments. Figures 1 through 4 graph the observed spot and precommitment prices and the observed spot price trend for 1998 for each of the four production regions. Observe that when a precommitment price is reported it is always below the corresponding spot price. Thus, in any given week, the exercise of a precommitment price lowers seller returns per unit. For the Watsonville and Santa Maria regions (Figures 1 and 2), reported precommitment prices appear consistent with expected spot prices. That is, precommitment prices are similar to the spot prices before and after them. In these figures, reported precommitment prices and spot prices that are not paired with a precommitment price are all in the range of \$5 to \$8 dollars per flat of 12, 1-pint baskets. Spot prices paired with a precommitment price are often higher. Most are in the \$8 to \$10.50 per flat range, although a few are below \$8, and the highest is almost \$16.

In a few cases reported precommitment prices were above the spot price trend. This raises the possibility that a precommitment may increase the expected spot market price, perhaps due to an increase in demand generated by promotions, or perhaps simply because with precommitment lid prices protect retailers against price risk. This is a very strong test because the observed spot market trend incorporates all unexpectedly high spot prices due to weather shocks and other factors.

Nonparametric regression analysis of the price data provides more information regarding the relationship between precommitment and spot prices.<sup>1</sup> For each region, a dummy variable representing the probability of a precommitment was regressed on the spot price to determine the probability of a precommitment price being reported as a function of the spot price. In Santa Maria

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<sup>1</sup> Nonparametric regression is an extremely flexible method for exploring the relationship between two variables that does not impose any functional form on the relationship, but allows it to be data-determined. For a dependent variable  $y_i$  (existence of a pre-commitment) and explanatory variable  $x_i$ , (spot price), the usual regression function can be written as  $y_i = m(x_i) + \xi_i$ . The nonparametric regression estimator is defined as the local weighted average of the observations on the dependent variable ( $y$ ) found in a band around the value of the explanatory variable ( $x$ ), or,

$$\hat{m}(x) = \sum_{i=1}^n w_i(x) y_i.$$

and Watsonville the probability that a precommitment price is reported is strictly increasing in the spot price. This suggests that in this region the primary effect of precommitments on seller returns is negative; when weather or other unexpected events increase the spot price, retailers pay the lower precommitment price.

In the other production regions the probability that a precommitment price is reported has an interior maximum within the range of reported spot prices. When precommitments are most likely to be reported in these regions, the spot price is not as low as it is when precommitment prices are not reported. Precommitments are unlikely to be reported when prices are very high. This suggests that retailers and shippers are undertaking promotions and supporting precommitments when there is sufficient strawberry volume to meet any increase in demand, rather than when strawberries are most scarce. This relationship raises the possibility that precommitment sales are indeed removing volume from the spot market to support promotions. Potentially, precommitments are associated with an increase the total quantity of strawberries demanded as a result of the promotions supported by precommitments.

### **Conclusion**

The directly observed effect of strawberry market precommitments is to lower prices relative to spot prices in a given week. However, additional analysis provides some evidence that precommitments may increase shipper returns by increasing total strawberry demand. The demand increase may be fueled by retailer promotions, which are commonly supported by precommitments.

The limited information regarding private precommitment sales in the *National Berry Report* allows us to make inferences about the effects of precommitments on shipper returns. The usefulness of the data suggests that the USDA should not necessarily reduce its information collecting and reporting efforts. Indeed, it should endeavor to collect and report information regarding formal and informal contract terms whenever possible. In addition to providing buyers and sellers with information on competitive considerations, it facilitates the analysis of the effects of changes in marketing practices on shipper and grower returns.

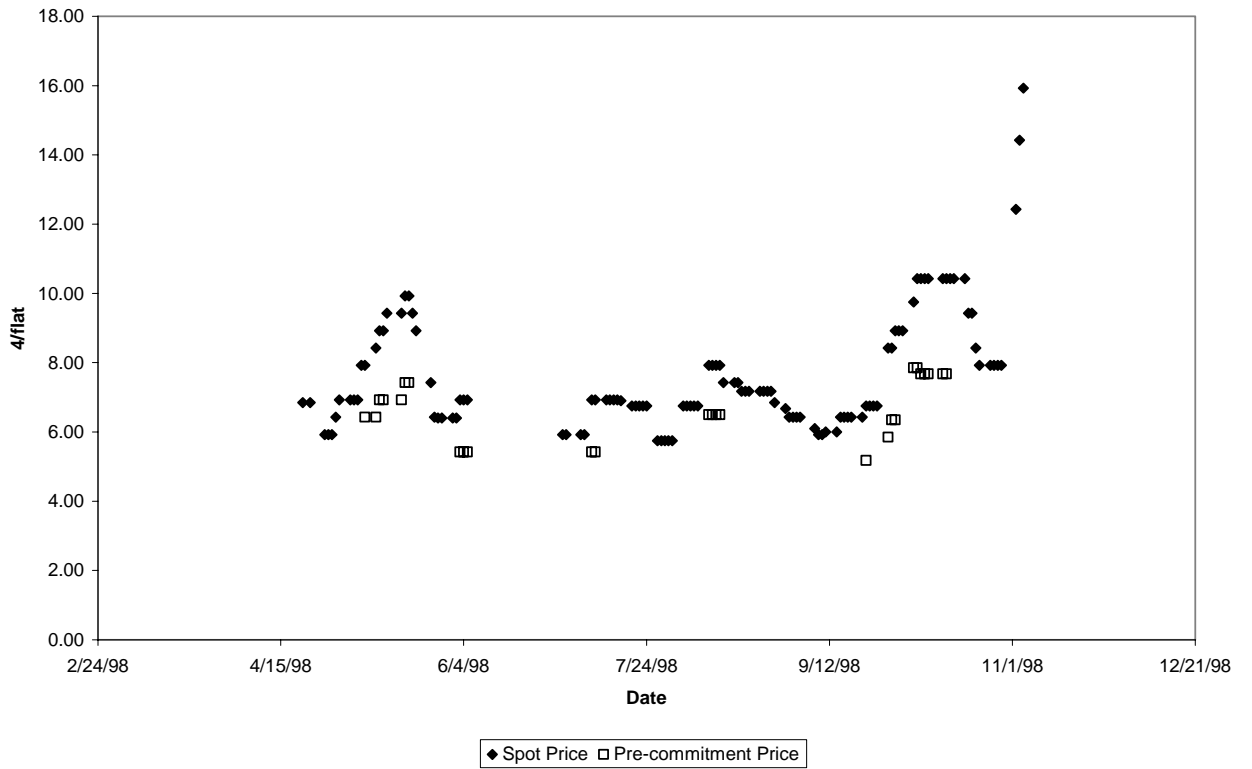
The most recent change in fresh strawberry marketing has been an increase in the use of formal contracts by shippers and retailers. More formal contracts provide retailers and shippers with greater certainty regarding product procurement and placement than do precommitments. Like precommitments, they remove volume from the spot market. Whether the effects of these contracts on the spot market will differ from the effects of precommitments will depend on their pricing provisions. For example, if formal contracts predominantly use the same lid price provision as precommitments, the effects will be largely the same. However, if the use of formal contracts changes retailer promotion decisions relative to the precommitment case, the effect of contracts on the spot market may change, even if pricing provisions are identical. Our analysis suggests that by continuing to collect and disseminate price information, the *National Berry Report* will facilitate the analysis of this latest market development.

**Table 1. Spot price and precommitment price averages and observations by region: 1995–2002**

<b>Region</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>
<b>Watsonville</b>								
Avg. spot price (\$/flat)	7.49	6.53	4.97	7.63	7.95	7.38	8.78	7.97
Observations	143	148	95	114	130	134	135	147
Avg. precommitment price (\$/flat)	5.65	5.43	7.02	6.64	6.22	6.44	8.1	7.01
Observations	29	31	6	27	79	25	32	21
Precomm/spot price	75%	83%	141%	87%	78%	87%	92%	88%
% Obs. reporting precomm	20%	21%	6%	24%	61%	19%	24%	14%
<b>Santa Maria</b>								
Avg. spot price (\$/flat)	7.9	6.56	4.95	7.5	7.34	6.81	8.15	7.46
Observations	121	103	98	32	23	52	53	59
Avg. precommitment price (\$/flat)	6.25	5.66	6.23	6.93	6.06	8.85	10.55	6.57
Observations	7	17	8	8	7	10	12	6
Precomm/spot price	79%	86%	126%	92%	83%	130%	129%	88%
% Obs. reporting precomm	6%	17%	8%	25%	30%	19%	23%	10%
<b>South District</b>								
Avg. spot price (\$/flat)	9.31	8.54	6.08	12.17	7.31	10.08	12.4	12.46
Observations	79	100	18	52	8	88	185	100
Avg. precommitment price (\$/flat)	8.75	8.12	6.85	14.43	0	7.61	11.73	12.72
Observations	13	38	2	5	0	14	42	17
Precomm/spot price	94%	95%	113%	119%	0%	75%	95%	102%
% Obs. reporting precomm	16%	38%	11%	10%	0%	16%	23%	17%
<b>Central Florida</b>								
Avg. spot price (\$/flat)	7.89	8.95	9.48	11.29	12.77	12.59	13.47	12.81
Observations	38	62	53	58	59	58	72	72
Avg. precommitment price (\$/flat)	7.09	8.32	9.23	8.5	8.69	7.92	10.1	9.53
Observations	21	26	17	37	30	18	20	16
Precomm/spot price	90%	93%	97%	75%	68%	63%	75%	74%
% Obs. reporting precomm	55%	42%	32%	64%	51%	31%	28%	22%

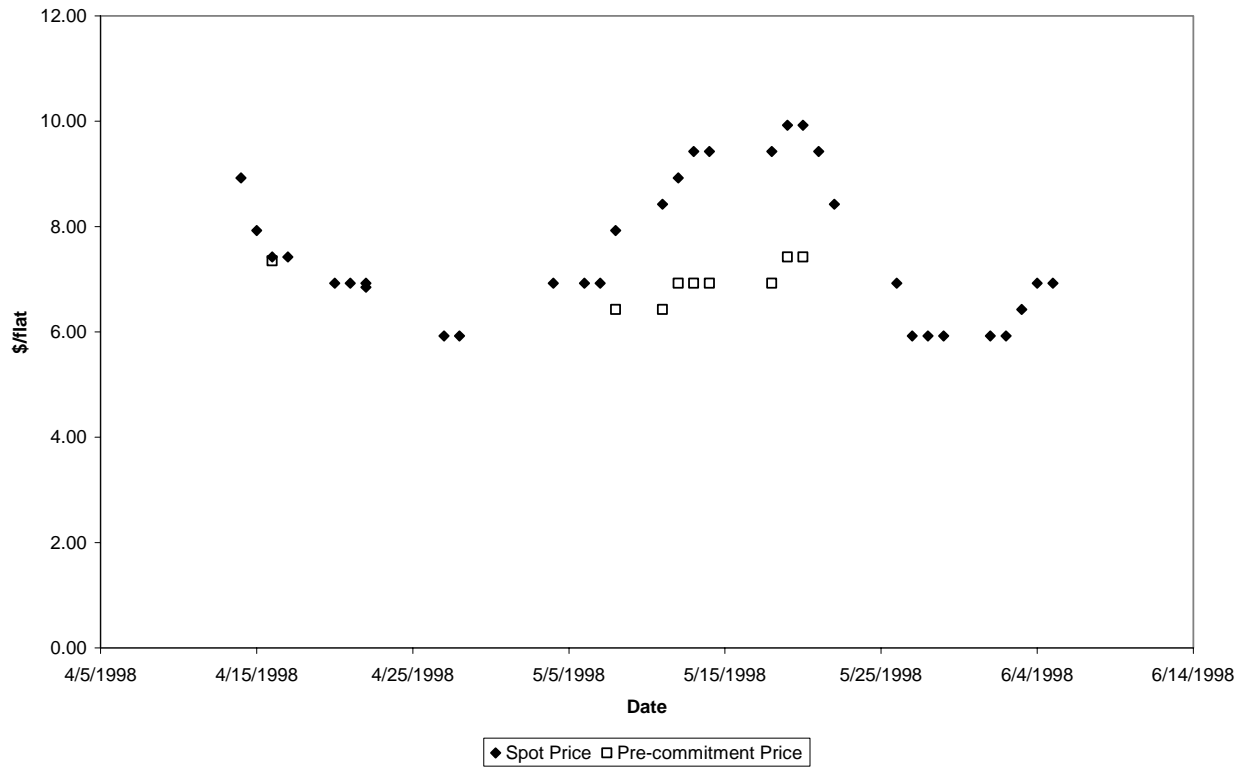
Source: *National Berry Report*, various issues.

Figure 1. Average spot and precommitment prices: Watsonville, 1998



Source: *National Berry Report*, various issues.

Figure 2. Average spot and precommitment prices: Santa Maria, 1998



Source: *National Berry Report*, various issues.



