



# UPDATE

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## Contractual Arrangements for Fresh Produce in California

by *Ethan Ligon*

*Contracts may help shield growers from price risk, but some exposure to price risk may help align grower and marketer interests. Ê*

**P**roducers of fruits and vegetables, especially for the fresh market, operate in an unusually risky economic environment. While these farmers face the same sorts of production risk common to much of agriculture, they also produce a perishable commodity whose price is subject to unusually large fluctuations. While some of this variation in prices is predictable (e.g. seasonal variation), much of it is not, depending instead on unforeseeable shocks to both supply and demand. Indeed, price risk is particularly important for fruit and vegetable growers; dry beans, fresh pears, lettuce, fresh apples, grapefruit, potatoes and onions exhibit the greatest degree of price volatility of any agricultural commodities. Further, despite the great risk, no futures contracts or commodity insurance schemes exist for most fresh fruit and vegetable production.

### Contracts

One important institution which does help to shield fruit and vegetable producers from both price and production risk are contracts, written between a producer and a "first handler," or intermediary who takes possession of fresh produce from the grower. Such contracts are of great importance for fresh produce. Roughly one third of total

agricultural production (by value) in the U.S. is produced under contract, and of this third, fruit and vegetable production accounts for some 20 percent.

Contracts between growers and first handlers are part of the process enabling "vertical coordination" in the food production chain. Vertical coordination is a general term used to signify ways of harmonizing the vertical stages of production and marketing. While the role that contracts play in coordination is no doubt important, another important reason for the use of contracts is to reduce the degree of risk (in both price and production) that growers must bear, since an appropriately designed contract allows the first handler to share both sorts of risks with the grower.

A distinction is often drawn between marketing and production contracts; the idea being that with a marketing contract the grower assumes all risks of production but shares price risk with the first handler, while with a production contract the grower provides husbandry, but the first handler owns the commodity (and thus bears a greater share of the risk). If we employ this distinction we find that marketing contracts are of much greater importance for fresh produce than for

CONTRACTUAL ARRANGEMENTS-

*Continued on page 2*

*Also in this issue.....*

### Plant Biotechnology in the Developing World: The Case of China

by *Scott Rozelle,  
Fangbin Qiao and  
Jikun Huang.....3*

### Pesticide Use, IPM and Pest Management Advice

by *Mark Metcalfe.....7*

### ARE Faculty Profile

*David Zilberman,  
UC Berkeley.....11*

*In the next issue.....*

### Changes in the North American Fresh-Market Tomato Industry Pose Challenges for California Tomato Growers

by *Roberta Cook-Canela*

other agricultural commodities; conversely, production contracts are little used. Of total contract production for all of U.S. agriculture (equal in value to some \$60 billion in 1997), approximately \$40 billion was produced under marketing contracts and \$20 billion under production contracts. Of this total, only \$1.1 billion (5.5 percent) worth of fruits and vegetables were produced under production contracts, while in contrast \$10.6 billion worth of fruits and vegetables were produced under marketing contracts (26.5 percent).

The outsized importance of price risk to fruit and vegetable producers accounts for the particular importance of marketing contracts for this population. However, a close examination of the actual contracts typically employed for fresh produce reveals that although these contracts almost always reduce the risk producers face, they almost never eliminate it entirely. Furthermore, the amount of risk first handlers are willing to shoulder depends importantly on the kind of commodity under contract.

At first glance, this may not seem surprising. After all, first handlers presumably don't like risk either, and, as it is usually the first handler who designs the contract, they would seem to have no more interest in sharing the risks faced by the producer than they would in increasing the prices they pay for produce. Closer examination, however, shows this view to be simplistic. After all, a first handler who is willing to share a grower's risk can charge for the service, since such a firm is implicitly offering not only marketing services to the producer, but also offering a measure of insurance. Furthermore, a first handler who contracts with many different producers can reduce total risk by pooling, since years which are difficult for one producer may be offset by a particularly profitable year for another. An effective pooling scheme could eliminate any grower-specific risks, making the compensation received by the grower depend only on the risk collectively faced by all the growers under contract with a particular first handler.

Unfortunately, by pooling all risks a first handler might reduce a grower's incentive to produce both quantity and quality. This problem is particularly obvious in the case of production risk. If a first handler were to make payments to the grower which depended only on acreage planted and not on harvest, the grower would have a powerful incentive to underinvest in costly inputs and labor. However,

the case seems much less clear when we consider price risk. Why don't first handlers make a payment which depends only on the quantity and quality of produce, observed at the farmgate?

It turns out that the main reason for price risk in contracts is that unobserved investments by the grower (e.g., labor effort, the application of fertilizers or pesticides) influence not only the quantity of the grower's output, but also its quality. By itself, this would not necessarily expose the grower to price risk. The first handler may be able to simply condition payments on the quality of the produce, if he can observe it. If the first handler is unable to observe quality directly, he may seek to infer it; objectively by measuring a variety of attributes of the produce, and perhaps also by more subjective means. However, if this inference is less than perfect, then the grower may well be exposed to price risk.

To see why poorly measured quality may expose the grower to price risk, consider the case of fresh, mature-green tomatoes. For tomatoes, the first handler may care a great deal about the quality of the tomatoes he purchases as the quality of the tomatoes will affect the price eventually paid by the consumer. The grower has a fair amount of control over some of these qualities. For example, by modifying his irrigation or pest management practices, he may be able to affect shelf life. However, judging the eventual shelf life may be extremely difficult to do at the farm gate, and may only become apparent when the tomatoes have actually become nearly unsalable. Because the first handler may be uncertain as to whether or not the tomatoes he has purchased do in fact have some of the qualities advertised, it may be optimal to ask the grower to pay some of the costs of short shelf life (or other qualities) by making his payment contingent on the prices eventually received by the firm.

Using data from a survey of the contracts offered by first handlers I conducted in 1999, we can get some handle on the relative importance of price risk and quality measurement in contracts. The sample frame was derived from the California Department of Food and Agriculture database of all firms licensed to purchase and broker agricultural products in California. The total size of this population is 4770.

CONTRACTUAL ARRANGEMENTS-

*Continued on page 10*

**Table 1. Frequency with which Payment to Growers is Tied Directly to Downstream Prices**

	Fresh Fruit	Fresh Veg	Processed Veg.	Winegrapes
Yes	67%	46%	24%	8%
No	33%	54%	76%	92%

Many of the firms licensed to buy wholesale agricultural products did not deal in fresh produce, and others only held a license for tax purposes (this allows a farm which packs and ships its own produce to divide its operations into two, one side of which “sells” to the other). Through a telephone screening of a random draw of respondents, I identified a sample of firms engaged in contracting for fruits and vegetables with “outside” growers. Based on the population of interest, surveys were mailed to managers of 635 firms. Given that there is a great degree of diversity in the commodity chain, we simplified the survey by asking participants to focus on the commodity that was most important in terms of their current activities.

Completed questionnaires were returned by 361 firms for a response rate of about 60 percent. To facilitate the analysis here I have divided the survey returns into the following groups: fresh fruit (30 percent), fresh vegetables (30 percent), processed commodities (14 percent) and wine grapes (26 percent).

For fresh growers the role of downstream prices is of clear importance, although there is a difference between fruit and vegetables. This difference is due, at least in part, to the fact that a considerable proportion of fresh vegetables is grown as part of a vertically integrated production and marketing chain.

One of the most important results established by the survey relates to the role of downstream prices in deciding the payment to the grower. If the grower’s compensation does not depend on downstream prices, the grower bears no price risk.

Table 1 gives some sense of the importance of price risk for different categories of commodities. For fresh growers the role of downstream prices is of clear importance, although there is a difference between fruit and vegetables. In this connection, note that a significant proportion of fresh vegetables are grown as part of a vertically integrated production and marketing chain, which helps to account for the difference in the figures above. Equally impor-

tant is that for wine grapes and processed commodities almost all growers receive payments that are not based on downstream prices.

To account for the fact that downstream price risk is of relatively small importance for processed commodities and wine

grapes, note that for many of these commodities, the produce of many different growers is commingled. This often makes it difficult to assign responsibility for different outcomes to different growers. For example, contrast the case of processing tomatoes for paste to the mature-green tomatoes discussed above. Although a processor may face quality problems which affect the value of the final product, in such cases it is likely to be difficult to assign blame to a particular grower. Accordingly, processors and vintners are much more likely to rely on careful quality measurement and condition grower compensation on the outcomes of these measurements rather than on downstream price realizations.

## Conclusion

Contracts in agriculture play an important role in reducing the risk faced by producers. However, there is a trade-off between risk-reduction and the provision of incentives. A perfectly insured grower will have less incentive to make costly investments in inputs or effort than would a grower with no such insurance. On the other hand, if the risks associated with a particular commodity are too great, growers will choose to devote their time and resources to the production of safer alternatives.

Examination of contracts governing the production of fruits and vegetables in California are generally consistent with the predictions of theory. Further, variation in the kinds of risk in contracts across different commodities matches what we’d expect if these contracts are designed in such a way as to use risk to provide grower incentives.

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