Cotton Forward Contracting in Maricopa, Pima, Pinal and Yuma Counties in the Years 1974-79

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Summary

Forward contracting has been widely used by Arizona Cotton farmers beginning with the 1973 crop and continuing through the 1981 crop. Forward contracting while sometimes providing an opportunity to sell at prices higher than available at harvest time at other times allows the fsrmer to sell at prices below the prices available at harvest time. A comprehensive study of forward contracting during the 1974-79 period has been completed and is reported in this paper. This research finds that during the study period farmers raised their average selling price by slightly more than one cent per pound through their forward contracting activity. The small price enhancement was achieved in addition to other positive benefits from forward contracting that were not measured in this study.

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Introduction

The price of cotton was determined primarily by Government programs during the period from 1954 to 1972. During that period the marketing decisions by individual cotton growers had relatively little opportunity to influence the price they received from cotton. Since 1972, Government programs have had virtually no direct influence on price, and with the general availability of forward contracting since the spring of 1973 cotton growers have had very substantial opportunity to raise or lower their incomes by their choice of a time to forward contract.

There are two primary ways that forward contracting may influence the success that a farmer achieves in managing his farming business. One influence on the farmer is that he will usually find easier access to production loans and perhaps receive operating capital on more favorable terms after he has sold some substantial part of his crop on forward contract. The value of access and terms on production loans facilitated by forward contracting is essentially impossible to measure in dollars, but the value will almost always be positive.

This paper reports on a comprehensive study of forward contracting of cotton in Arizona for the crop years 1974 through 1979. This study focused on the measurement of whether forward contracting, as it actually occurred during the 1974-79, raised or lowered growers' prices relative to the available spot price in Phoenix.

An Outline of the Study of Forward Contracting

Essentially all of the forward contracts written on cotton ginned at 30 to 41 gins in Maricopa, Pima, Pinal and Yuma counties for the years 1974-79 were included in the study. Forward contracting had become a common practice in 1973, but records for that year were generally not organized in a way that allowed their inclusion in the study. Cotton produced by members of cotton marketing cooperatives was not included in the study although the cooperatives have marketing alternatives that have some of the same characteristics as forward contracting. It is estimated that the cotton included in the study ranged from a low of 20.3 percent in 1974 to a high of 26.8 percent of the cotton produced in the central and western Arizona area in 1977.

The maximum potential for forward contracting of cotton included in the six years was about 1,170,000 bales while approximately 788,320 bales were forward contracted. This study defines four types of contracts as follows:

First-contracts-
These contracts require the delivery of a specific number of bales from specific tracts of land that have had no bales previously contracted for the particular crop year.

Additional-contracts-
These contracts require the delivery of a specific number of bales from specific tracts of land that have had specified number of bales previously contracted for the particular crop year. By these definitions there may be more than one additional-contract on a tract of land but only one first-contract.

Balance-contracts-
These contracts require the delivery of any and all cotton harvested from specific tracts after first contracts and additional-contracts on those tracts have been satisfied.

Acre-contracts-
These contracts require the delivery of any and all cotton harvested from specific tracts on land that have no previous first-contracts or additional-contracts. Ground cotton may be excluded from delivery on acre-contracts.

Forward contracting has sometimes occurred as much as 18 months prior to harvest of the cotton. Four time periods have been defined in order to facilitate the analysis, presentation of results and planning of future forward contracting strategies. The four time periods are defined as follows:

Preplanning-period-
This is a period of time when cotton growers normally give primary attention to growing and harvesting the preceding cotton crop. As defined here this period begins in April and continues through November of the year prior to the time this particular cotton crop is planted.

Planning-period-
This is a period of time when growers have completed or nearly completed harvest of the preceding cotton crop and normally do most of their planning for the next cotton crop. As defined here the planning-period includes the months of December through February immediately preceding the planting of the cotton crop.

Planting-period-
This is a period when the cotton crop that is being forward contracted is planted. As defined here this time period includes the months of March through May and the first week of June. While most of the cotton in the four county area is planted in March and April, there has been a good deal of acreage planted to cotton following the harvest of barley and wheat, and this necessarily extends the planting season into June. This late planted cotton seems especially sensitive to available price on forward contracts.

Growing-period-
This is the period from planting to harvest. As defined here it begins after the first week in June and continues through the first week in December. During this period the acreage of cotton remains unchanged, but the yield per acre may be somewhat responsive to price available on forward contract.

It is necessary to establish some arbitrary standard for comparison in order to judge the overall benefits that forward contracting has provided to Arizona cotton growers through affecting their average selling price. In this study the standard for comparison is the average Phoenix spot price each year in the week that includes December 1st. The test of forward contracting then asks whether the forward contract price on each contract was above or below what would have been obtained by spot market sale in early December. This is certainly a possible alternative for the individual Arizona cotton grower, but if all Arizona cotton growers sold their cotton on the spot market in the week of December 1st the spot price would be depressed somewhat.

This evaluation of the effect of forward contracting on grower prices of cotton should not be interpreted as the only effect on cotton growers. Forward contracting offers other benefits by giving a known price for the crop which allows the farmer to focus more of his attention on growing the crop efficiently rather than wondering what price will be available after the crop is harvested. Also the farmer can more easily borrow money to finance the production of the crop. These effects other than direct price effects are basically beyond measurement in dollar terms, but they are usually importnat enough that they will offset at least small negative price effects from forward contract.

Forward Contracting Effects on Grower Cotton Prices

Table 1 shows the estimated effects on the average producer price of cotton by type of contract and year. The number in the lower right corner of the table indicates that forward contracting over the entire 1974-79 period raised the average producer price of cotton by slightly more than one cent over the price that would have been achieved selling on the spot market at the end of harvest. The 1.04 cents applied to all of the cotton grown in Central and western Arizona in the six years means increased value of about 25 million dollars in addition to the benefits of having a fixed price. Acre-contracts produced greater benefits in raising the average price than did any of the other contract types. Acre-contracts have been available in Arizona only during relatively brief time periods. Only about 6 percent of the bales contracted were on acre-contracts, and all of this beneficial contracting activity occurred early in the 1974 and 1977 crop contracting. First-contracts and balance-contracts also raised the average producer price of cotton, but the year-to-year effect was highly variable on first-contracts. Additional-contracts had a small negative effect on average price, but it is reasonable to believe that the other benefits derived from having a fixed price more than cancel out the negative net effect of addtional-contract forward contracting.

Table 2 shows the estimated effects on the average producer price of cotton by time period and year. The bottom row of the table shows that forward contracting had relatively large positive effects on average producer price in 1974 and 1977 and relatively large negative effects in 1976 and 1978. Small negative effects occurred in 1975 and 1979. The potential gains through price effects was 45 to 50 million dollars in each of the 1974 and 1977 years or greater than 30 percent increase in the value of the crop in 1974 and greater than 20 percent increase in 1977. Of the time periods for forward contracting only the pre-planning-period showed substantial effect in raising the average price to producers. Forward-contracting during the planting-period during the 1974-79 period had the largest negative impact on average producer prices. This negative effect of forward contracting during the planting-period may be partially caused by financiers insisting that the cotton grower forward contract even though the availalbe forward contract price was not high enough to provide the grower with a positive inducement to forward contract. During the 1974-79 period forward contracting during the growing-period had relatively little effect on average producer prices. However, 1976 seems to be an interesting exception as only the growing-period forward contracting raised average price for that crop as price on forward contracts rose during the growing-period and then dropped again by early December.

Table 3 combines the forward contracting activity for all six years and cross-classifies by time of contracting and type of contract. Forward contracting during 1974-79 raised average prices for each of the four types of contracts during the preplanning-period. The only other combinations of time of contracting and type of contract that raised average prices by more than negligible amounts were acre-contracts in the planning-period and balance-contracts in the growing-period. The latter contracting occurred primarily in 1976 when prices rose fairly continuously from the middle of the planting-period to the middle of the growing-period and then declined somewhat by early December.

Table 4 presents a more detailed picture of the performance of forward contracting than that presented in Tables 1, 2 or 3. The interpretation of the numbers in Table 4 is that the number in the upper left corner of the table indicates that first-contracts in the preplanning-period for the 1974 crop raised the average price received for all cotton avialable for forward contracting in the 1974 crop by 3.34 cents. Forward contracting on the 1974 crop raised the average price of the 1974 crop by 11.92 cents per pound. Each combination of contract type and contracting period resulted in increased average price for the 1974 and 1977 crops. Forward contracting on the 1978 cotton crop shows reduced average price for the crop for every combination of type of contract and contracting period with all contracting

The summary information in Table 4 shows that forward contracting has considerable potential for raising or lowering the average price that growers receive for their cotton crops. This study of forward contracting of cotton in Arizona suggests that the preplanning-period in years when buyers are eager to forward contract has generally been very beneficial for the grower. Generally the planting-period has been the least satisfactory time for the grower to forward contract. The latter results may occur because growers are generally more aggressive about forward contracting at this time, and some sources of operating capital insist that the farmer forward contract a part of his crop before lending the funds. With the exception of 1976, the forward contracting during the growing-period did not have much influence on average price. This probably occurs because of the relatively short time periods as the growing season immediately precedes the early December base period, and therefore the price usually changes relatively little.

The research results presented in this report are directly representative of whathappened in Arizona cotton forward contracting in the period 1974-79 and may or may not be representative of what will occur in the years following 1979. The reader should also be cautioned that while forward contracting was beneficial in certain combinations of time period and type of contract in the past this reflects average events that occurred and do not guarantee that everyone contracting in those time periods found contracting to be beneficial.

There is a natural tendacy for cotton growers to want to forward contract when the available price is high relative to past experience or their costs of production, and there is a natural reluctance to contract when the available price is low. These natural instincts seem to have served Arizona cotton growers fairly well for the entire 1974-79 period giving them a small increase in average price in addition to the other benefits of forward contracting such as access to credit at more favorable terms and a known price to allow them to concentrate more of their attention to growing the crop more efficiently.

Strategies in Forward Contracting Arizona Cotton

The research results presented in this report illustrate that forward contracting had very great potential for raising or lowering gross receipts from the sale of cotton. The crucial problem of course, is deciding when to forward contract and when not to forward contract. Freedom in making this decision may be serverely limited by the source of operating capital that is needed to grow the crop.

Generalities are difficult to establish from the experience of the 1974-79 period. The 1974-79 experience may not provide a good basis for predicting what will happen in the future. The greatest success in forward contracting occurred on the 1974-79 crops when the spot price of the preceding cotton crop was very high during its harvest period. Large quantities of the 1974 and 1977 cotton crops were contracted a full year before the harvest periods for these crops, and growers doing this contracting raised the price of their cotton by nearly 50 percent on the 1974 crop and by more than 30 percent on the 1977 crop.

Because cotton markets are influenced by an immense number of forces of highly diverse nature it is unlikely that any single strategy on forward contracting will be continuously superior to all other strategies. The research on forward contracting persented in this report in addition to other on-going research on cotton markets should provide a basis for outlining superior strategies in forward contracting for Arizona cotton growers.

Basic Strategy:

When the available price on forward contract is low in the range of prices for recent years, go slow on forward contracting. When the current spot price of cotton is high in the range of recent past prices, contract some cotton that will be harvested within the next 18 months. Growers should never contract to deliver more bales of cotton than they are very certain they will harvest.

Defensive Stragegy:

This strategy begins with the presumption that it is impossible to forecast the future levels of cotton prices. From this it follows that growers should fix their cotton prices at several different dates over the span of time beginning with first availabiltiy of forward contracts on a particular crop, to several months after the crop is harvested. This should be tempered by the Basic Strategy. This strategy is defensive because its primary accomplishment is to avoid fixing the price for the entire crop on the day with the lowest price.

Table 1. Type of Contracting Effects in Raising or Lowering Growers' Average Cotton Prices for Entire 1974-79 Period

	1974	1975	1976	1977	1978	1979	All Years
	Cents per pound						
First-Contracts	.95	-.11	-.90	1.48	-1.02	-.09	.31
Additional-Contracts	.32	-.02	-.33	.47	-.53	-.02	-.11
Balance-Contracts	.07	—	.19	—	-.05	X	.21
Acre-Contracts	.42	—	X1/	.23	-.02	X	.63
All-Contracts	1.76	-.13	-1.04	2.18	-1.62	-.11	1.04

Table 2. Time of Contracting Effects in Raising or Lowering Growers' Average Cotton Prices for Entire 1974-79 Period

	1974	1975	1976	1977	1978	1979	All Contracts
	Cents per pound						
Preplanning-period	.97	X1/	-.10	1.31	-.03	-.01	2.14
Planning-period	.71	—	-.70	.61	-.84	-.06	-.28
Planting-period	.06	-.06	-.44	.25	-.64	-.04	-.87
Growing-period	.02	-.07	.20	.01	-.11	X	.05
All-periods	1.76	-.13	-1.04	2.18	-1.62	-.11	1.04

Table 3. Time of Contracting and Type of Contracting Effects in Raising or Lowering Growers' Average Cotton Prices for Entire 1974-79 Period

	First-Contracts	Additional-Contracts	Balance-Contracts	Acre-Contracts	All Contracts
	Cents per pound				
Preplanning-period	1.27	.27	.06	.54	2.14
Planning-period	-.38	-.03	.02	.11	-.28
Planting-period	-.51	-.30	-.04	-.02	-.87
Growing-period	-.07	-.05	.17	X1/	.05
All-periods	.31	-.11	.21	.63	1.04

1/X Means less than .005 cent per pound

Table 4. Type of Contract and Time of Contracting Effects in Raising or Lowering Cotton Growers' Average Cotton Prices by Individual Years, 1974-79

	First-Contracts	Additional-Contracts	Balance-Contracts	Acre-Contracts	All-Contracts
	Cents per pound				
1974					
Preplanning-period	3.34	.57	.40	2.28	6.59
Planning-period	2.90	1.26	.10	.56	4.82
Planting-period	.19	.21	—	—	.40
Growing-period	.02	.09	—	—	.11
Total	6.45	2.13	.50	2.84	11.92
1975					
Preplanning-period	.01	—	—	—	.01
Planning-period	—	—	—	—	—
Planting-period	-.52	-.08	—	—	-.60
Growing-period	-.61	-.18	—	—	-.79
Total	-1.12	-.26	—	—	-1.38
1976					
Preplanning-period	-.68	-.06	—	—	-.74
Planning-period	-4.07	-1.01	—	—	-5.08
Planting-period	-1.79	-1.33	-.04	-.06	-3.22
Growing-period	-.04	.01	1.42	.06	1.45
Total	-6.58	-2.39	1.38	-X1/	-7.59
1977					
Preplanning-period	4.42	.94	—	1.00	6.36
Planning-period	2.00	.81	—	.12	2.93
Planting-period	.67	.53	—	—	1.20
Growing-period	.07	—	—	—	.07
Total	7.16	2.28	—	1.12	10.56
1978					
Preplanning-period	-.15	-.01	—	—	-.16
Planning-period	-3.09	-1.24	—	—	-4.33
Planting-period	-1.82	-1.24	-.15	-.08	-3.29
Growing-period	-.16	-.26	-.08	-.03	-.53
Total	-5.22	-2.75	-.23	-.11	-8.31
1979					
Preplanning-period	-.05	-.01	—	X	-.06
Planning-period	-.26	-.03	—	—	-.29
Planting-period	-.12	-.04	—	—	-.16
Growing-period	.01	.01	-.02	—	X
Total	-.42	-.07	-.02	X	-.51

1/ means less than .005 cent per pound