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FORECASTING COTTONSEED PRICES IN GEORGIA
DURING THE 1974-75 CROP YEAR

by

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INTRODUCTION

Economic events since the 1972-73 crop year have generated much
interest in cottonseed prices. Cotton producers have observed an
approximate doubling of wholesale prices of cottonseed oil and meal
during the last three years and have wondered whether they are getting
an equitable share of this increased income. The implied concern is
that the margin between gin-run cottonseed prices and cottonseed pro-
duct prices is too large.

To alleviate this market uncertainty, Ethridge and Brannen authored
a research report entitled "Cottonseed Prices in Georgia: An Analysis
of the Wholesale Marketing Margin" [1]. Methodology was proposed to
determine expected farm price for cottonseed in Georgia, given wholesale
prices of cottonseed products and an index of costs involved in process-
ing and handling cottonseed. Linear regression estimation was used on
annual data covering the marketing years 1962-63 to 1972-73. The authors
stated that: "Before this regression model is used to estimate farm
cottonseed price for the 1974-75 marketing season, actual 1973-74 price
and cost data should be included in the data pool and a new regression
equation obtained using this additional information." [1, p. 19].

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There has been considerable interest expressed in having this done; therefore, this paper undertakes the task. Those who are interested in additional detail about methodology and data used may refer to the broader research report [1].

OBJECTIVES AND PROCEDURE

The objective of this paper is to estimate, for alternative prices of cottonseed oil and meal, prices that will be paid to Georgia farmers for their cottonseed during 1974-75. Thus, the emphasis is on what level of farm prices to expect, based on marketing margin behavior during the past twelve years. No attempt is made to assess equity of the marketing margin during past years, but only to use past behavior to estimate current price.

There are four marketable products obtained from crushed cottonseed: oil, meal, linters and hulls. Technical yield coefficients per ton of cottonseed may be obtained from the U.S. Department of Agriculture [7], as may estimates of wholesale prices per ton of each product [7]. This information may be combined to estimate the value of products obtained from a ton of cottonseed [1, pp. 4-6].[1]/

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[1]/Some misinformation needs to be corrected concerning oil and meal prices in Table 2, page 6 in [1]. The impression is given that all product prices are based on the crop year, August-July. This is true for hulls and linters, but oil and meal prices are based on the calendar years, January-December. This amounts to a 7-month lag for these prices, which seems appropriate because of the existence of forward contracting of oil and meal during the months preceding actual harvest of the crop. In fact, use of calendar year data for oil and meal prices results in a better statistical fit than when crop year data are used.

Putting these wholesale value and marketing cost data with U.S. Department of Agriculture data on Georgia farm prices for cottonseed [8], the following regression equation may be estimated:

$$P = a + b V + c I,$$

where a, b and c are estimated parameters, P is farm cottonseed price, V is wholesale value of cottonseed products, and I is the marketing cost index.

ESTIMATION RESULTS

Adding 1973 data to the 1962-72 data given in [1][2] and performing linear regression estimation on the above equation results in the following:

$$(1) \quad P = 8.15 + 0.81V - 0.29I \qquad ; \quad R^2 = 0.98,$$
$$(4.69) \quad (0.05) \quad (0.06)$$

where numbers in parentheses below estimated coefficients are standard errors of the coefficients and R^2 is the coefficient of determination. $R^2 = 0.98$ means that 98% of the total variation in farm price is accounted for by the regression equation. A plot of actual versus estimated annual farm prices during 1962-73 is shown in Figure 1.

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[2] The 1973 data is as follows: Farm price - $95.00 per ton; wholesale value - $160.63 per ton (obtained from per-ton product prices of $353.70 for oil, $174.30 for meal, $186.80 for linters, and $21.00 for hulls); and marketing cost index - 146.5 (obtained from component cost indexes of 146.7 for labor, 127.0 for machinery, 166.2 for transportation, and 145.5 for fuel and electricity).

Figure I. Comparison of Actual and Estimated Values of Farm Cottonseed Prices in Georgia Using Regression Equation (I), 1962-73
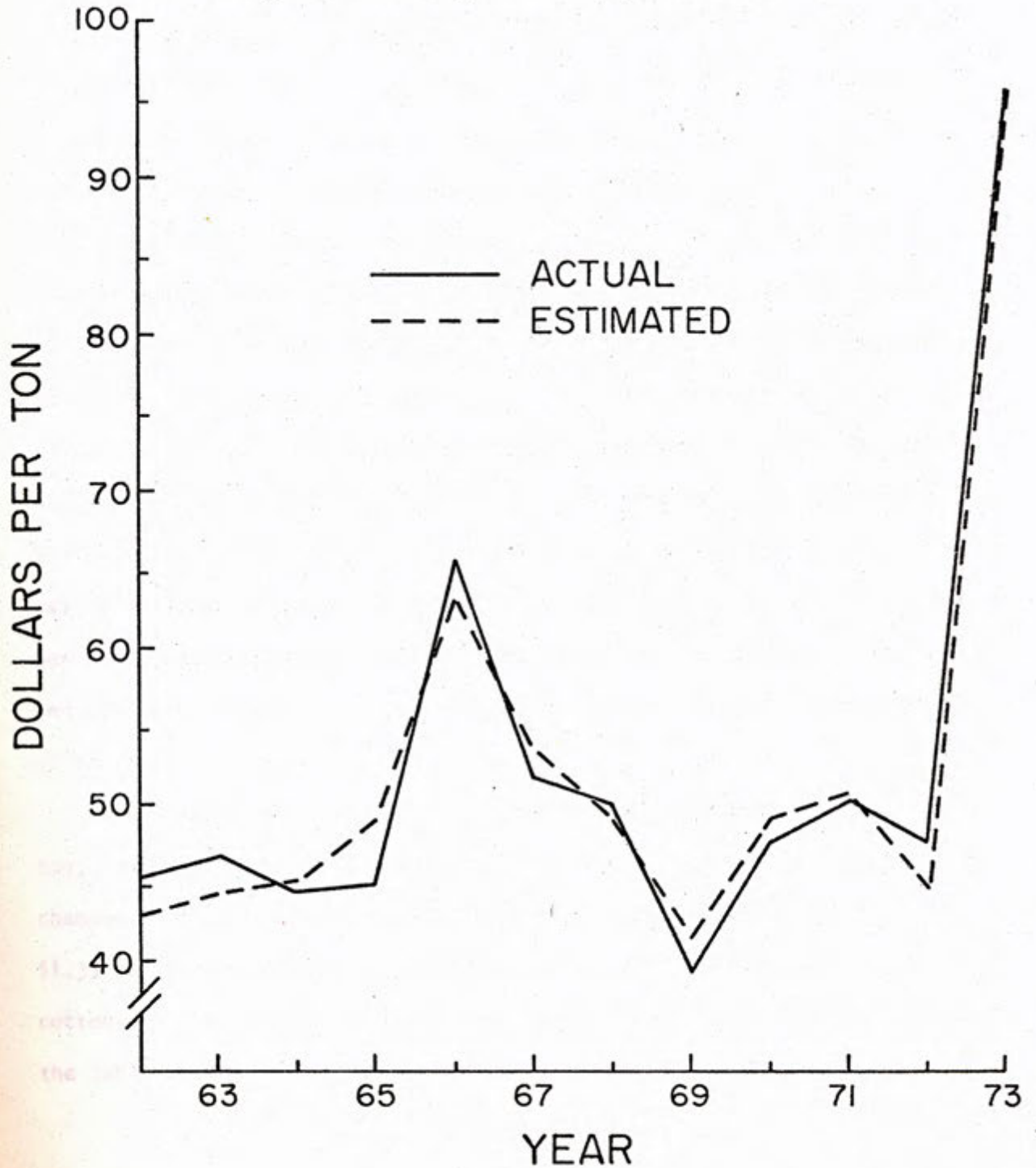
COTTONSEED PRICE ESTIMATES

Using regression equation (1), farm price for cottonseed in Georgia (P) may be forecasted for given levels of the wholesale product value (V) and the marketing cost index (I). The forecast will not be normative; i.e., it will not necessarily designate a price that is "fair" or "equit-able" to farmers or cottonseed crushing mills. It will, however, deter-mine a farm price that is consistent with past marketing margin behavior in Georgia. Thus, it is a good target price which would command an ex-planation if actual farm price did not approximate it.

Table 1 gives forecasted farm prices per ton of cottonseed as (1) wholesale meal price varies, in $5.00 increments, from $130.00 per ton to $170.00 per ton and (2) wholesale oil price varies, in $10.00 increments, from $750.00 per ton (37.5¢ per pound) to $860.00 per ton (43.0¢ per pound). Thus, if meal price is $150.00 per ton and oil price is 41.0¢ per pound, the respective column and row intersect at a predicted cottonseed price of $147.82 per ton (Table 1). This prediction and all others in the table assume an average linters price of 9¢ per pound, a hull price of $60.00 per ton, and a marketing cost index equal to 173.0%. Procedure for adjust-ing predicted prices for index and price changes is given in the footnote of Table 1.

It may be observed in Table 1 that as meal price changes $5.00 per ton, farm cottonseed price changes $1.88 per ton. Also, as oil price changes one-half cent per pound, farm cottonseed price changes $1.32 or $1.33 per ton (depending on rounding error). Using these facts, farm cottonseed prices associated with oil and/or meal prices not included in the table may be easily derived.

Table 1. Forecasted Prices of Cottonseed in Georgia for Selected Prices of Cottonseed Oil and Meal, 1974-75 Crop Year[a]

Cottonseed Oil Price		Cottonseed Meal Price in Dollars per Ton								
¢/lb.	$/ton	130.00	135.00	140.00	145.00	150.00	155.00	160.00	165.00	170.00
37.5	750.00	131.01	132.89	134.77	136.65	138.53	140.41	142.28	144.16	146.04
38.0	760.00	132.34	134.22	136.10	137.98	139.85	141.73	143.61	145.49	147.37
38.5	770.00	133.67	135.55	137.42	139.30	141.18	143.06	144.94	146.82	148.70
39.0	780.00	134.99	136.87	138.75	140.63	142.51	144.39	146.27	148.15	150.03
39.5	790.00	136.32	138.20	140.08	141.96	143.84	145.72	147.60	149.48	151.36
40.0	800.00	137.65	139.53	141.41	143.29	145.17	147.05	148.93	150.81	152.68
40.5	810.00	138.98	140.86	142.74	144.62	146.50	148.38	150.25	152.13	154.01
41.0	820.00	140.31	142.19	144.07	145.95	147.82	149.70	151.58	153.46	155.34
41.5	830.00	141.64	143.52	145.39	147.27	149.15	151.03	152.91	154.79	156.67
42.0	840.00	142.96	144.84	146.72	148.60	150.48	152.36	154.24	156.12	158.00
42.5	850.00	144.29	146.17	148.05	149.93	151.81	153.69	155.57	157.45	159.33
43.0	860.00	145.62	147.50	149.38	151.26	153.14	155.02	156.90	158.78	160.66

[a] Throughout the table, average cottonseed linters price is set at 9¢ per pound and hull price is set at $60.00 per ton. If linters price varies 1¢ per pound, then each entry in the table varies $1.46 in the same direction. If hull price varies $5.00 per ton, then each entry in the table varies $1.18 in the same direction. The marketing cost index is set at 173.0%. A change of 1 percentage point in this index will cause each entry in the table to change 29¢ in the opposite direction.

CONCLUSIONS

This paper has presented forecasted farm cottonseed prices which will provide farmers and ginners with usable reference prices during 1974-75. However, a word of caution is in order. Too rigid an interpretation of these forecasted prices should be avoided. An observed price variation of $10.00 per ton from the forecasted price, for example, is not basis for concluding that the marketing system is a failure. Random variation around regression estimates is an anticipated occurrence. But the variation around estimated values should be random; i.e., observed annual price should be above forecasted annual price as often as it lies below. If observed market price tends to be consistently above or below forecasted price from year-to-year, then either the estimating equation or the marketing system is not doing a good job.

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