

TEXAS-OKLAHOMA PRODUCER COTTON MARKET SUMMARY: 2004/2005

Mohamadou L. Fadiga, Sukant K. Misra and Don E. Ethridge
Texas Tech University
Lubbock, TX

Introduction

This report summarizes the price, premium, and discount estimates for the 2004/05 marketing year (August 1, 2004 to July 31, 2005) based on spot market transactions throughout the West Texas and East Texas/Oklahoma regions. The estimates are derived on a daily basis using the Daily Price Estimation System (DPES), a computerized price analysis system that combines statistical estimation and spreadsheet computation, to estimate the relationship between spot price in these two regions with a set of nine cotton quality attributes as defined by the USDA. These attributes include fiber length, fiber strength, fiber length uniformity, micronaire, leaf content, color grade, bark content, other extraneous matter content, and preparation (USDA, 1995). A detailed description of the model and the weighted averages of the parameter estimates are presented in Appendix A of this report.

The purpose of the analysis is to determine the base price and calculate the premiums and/or discounts associated with each attribute. The report is organized as follows: the first section presents the 2004/05 crop statistics; the second section summarizes and discusses the average price, premiums, and discounts for the 2004/05 marketing year; and the last section discusses the movements of premiums and discounts associated with each characteristic.

2004/05 Crop Statistics

The average cotton spot price for the 2004/05 marketing year was 36.42 cents a pound, about 43 percent lower than its 2003/04 level (Table 1). The total number of bales per sale increased from 96.38 to 108.47 bales per sale, representing the fourth crop year in a row with an increase in average bales per sale. The total volume of transactions for the 2004/05 marketing year amounted to 10,603 with a total of 1,150,155 bales sold. The West Texas region accounted for 82.4 percent of the transactions and 86 percent of the volume of sales. Although the shares of transactions between West Texas and East Texas/Oklahoma regions remained the same, the share of total bales sold in the West Texas region increased from 79% in the 2003/04 marketing year to 86% in the 2004/05 marketing year.

Most of the transactions in the 2004/05 marketing year occurred between mid-December and the end of February (Figure 1). The base prices in the two regions exhibited similar behavior during the 2004/05 marketing year, averaging about 38.5 and 39 cents a pound. As Figure 2 indicates, the movement of the base price in West Texas shows two distinct patterns in 2004/05. At the beginning of the marketing year, from November 8 to February 9, the base price fluctuated between 38 and 43 cents a pound; then followed an upward trend to reach 50 cents a pound in mid-April before falling to 43 cents a pound at the end of the marketing year. With regard to quality attributes during the 2004/05 marketing year, the average leaf grade increased to 3.57 compared to 2.78 in 2003/04 (Table 1). The first and second digit color grade also increased substantially compared Table 1. Texas-Oklahoma Crop Statistics Averages from DPES, by Marketing Year to the 2003/04 marketing year. The first and second digit color grade were comparable to their 2002/03 levels. There was a slight decrease in staple length (33.97 vs. 34.03 32nds/inch) and strength (28.31 vs. 28.96 gram/tex). Micronaire decreased (3.71 vs. 4.35), while uniformity decreased slightly (80.10 vs. 80.82) between the two marketing years. Average level 1 bark increased, while level 1 other extraneous matter and preparation 1 decreased in the 2004/05 marketing year.

Table 1. Texas-Oklahoma Crop Statistics Averages from DPES, by Marketing Year

Attribute	2004/05	2003/04	2002/03	2001/02
Price (Cents/lb.)	36.42	63.68	41.98	26.24
Bales per Sale	108.47	96.38	92.17	73.00
Leaf Grade	3.57	2.78	3.80	2.90
First Digit of Color Grade	3.70	2.41	3.36	2.52
Second Digit of Color Grade	1.49	1.08	1.23	1.35
Staple	33.97	34.03	33.29	33.5
Strength	28.31	28.96	28.32	28.31
Micronaire	3.71	4.35	4.33	4.41
Uniformity	80.10	80.82	80.77	80.88
Level 1 Bark (%)	47.01	5.17	18.75	9.55
Level 2 Bark (%)	0.01	0.00	0.00	0.00
Level 1 Other (%)	0.04	0.13	0.23	0.02
Level 2 Other (%)	0.00	0.00	0.01	0.00
Preparation 1 (%)	0.06	0.20	0.01	0.05
Preparation 2 (%)	0.00	0.00	0.00	0.00

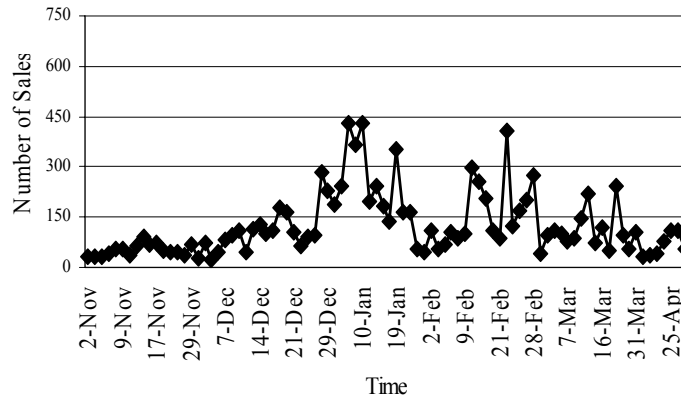


Figure 1. Daily Volume of Transactions for the 2004/05 Marketing Year.

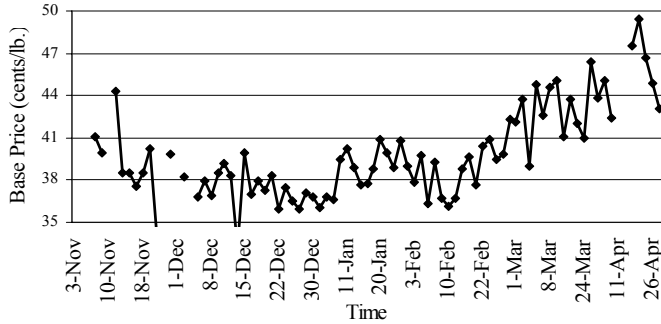


Figure 2. Movement of Base Prices for the 2004/05 Marketing Year, West Texas.

Average 2004/05 Prices, Premiums, and Discounts

The DPES uses a hedonic model to estimate the relationship between spot price and a set of nine quality attributes (i.e., staple length, first digit color grade, second digit color grade, micronaire range, leaf grade, uniformity, strength, bark, and preparation) and a regional variable to separate West Texas and East Texas/Oklahoma regions. The goal of this estimation is to calculate the daily premiums and discounts associated with each characteristic. The results of this estimation are then used to calculate the weighted averages of the parameters for the entire marketing year and to calculate the yearly base prices, premiums, and discounts in the two regions. Tables 2 and 3 present the yearly averages of the base price and premiums and discounts associated with the nine quality characteristics for the West Texas and East Texas/Oklahoma regions. The average base price was 39.08 cents per pound for the West Texas region and 38.93 for the east Texas/Oklahoma region.

Table 2. 2004/05 Weighted Average Price Estimates from DPES, West Texas

Color Grade and Staple Premiums and Discounts													
	Staple Length												
	28	29	30	31	32	33	34	35	36	37	38		
C o l o r	11	-519	-385	-262	-150	-53	30	97	148	181	196	196	
	21	-581	-449	-328	-219	-123	-42	24	74	106	122	122	
	31	-612	-482	-362	-254	-159	-78	0	36	68	83	83	
	41	-675	-548	-430	-324	-231	-152	39.08*	0	0	7	7	
	51	-772	-648	-534	-431	-341	-264	-202	-155	-125	-110	-110	
	61	-951	-834	-726	-629	-544	-471	-413	-369	-340	-327	-327	
	71	-1152	-1043	-943	-852	-773	-705	-651	-610	-583	-570	-570	
	G r a d e	12	-689	-562	-445	-339	-246	-168	-104	-56	-24	-10	-10
		22	-689	-562	-445	-339	-246	-168	-104	-56	-24	-10	-10
		32	-717	-591	-474	-370	-278	-200	-137	-89	-58	-43	-43
42		-749	-624	-509	-405	-314	-237	-174	-127	-96	-82	-82	
	52	-870	-750	-639	-540	-452	-378	-318	-272	-243	-229	-229	
	62	-1015	-900	-795	-700	-617	-546	-489	-446	-417	-404	-404	
	23	-856	-735	-624	-524	-436	-361	-301	-255	-225	-212	-212	
	33	-856	-735	-624	-524	-436	-361	-301	-255	-225	-212	-212	
	43	-905	-786	-677	-578	-491	-418	-358	-314	-284	-271	-271	
	53	-926	-808	-700	-602	-516	-443	-384	-340	-310	-297	-297	
	63	-1188	-1080	-981	-892	-813	-747	-693	-652	-626	-613	-613	
	34	-1076	-964	-861	-768	-686	-617	-561	-519	-491	-478	-478	
	44	-1263	-1158	-1062	-975	-899	-834	-782	-743	-717	-705	-705	
	54	-1292	-1188	-1093	-1007	-932	-868	-816	-777	-751	-739	-739	
Micronaire Differences		Leaf Grade Differences			Uniformity Differences			Strength Differences					
Mike Range	Disc	Leaf Grade		Prem./	Uniformity		Disc./	Grams/Tex.		Disc./			
<24	-663			Prem.			Prem			Prem			
25 - 26	-563	1		49	<77		-28	<18		--			
27 - 29	-410	2		49	78		-21	19		--			
30 - 32	-253	3		47	79		-14	20		--			
33 - 34	-149	4		0	80		-7	21		--			
35 - 49	0	5		-90	81		0	22		-209			
50 - 52	-206	6		-219	82		7	23		-157			
>53	-299	7		-385	83		14	24		-112			
	Level 1	Level 2			84		--	25		-72			
Bark	-224	-1828			85		--	26		-38			
Preparation	-1325	-1325			>86		--	27 - 28		0			
Other Ext. Matter	-1428	-1428						29		23			
								30		12			
								31 - 32		12			
								>33		12			

All Premiums and discounts are expressed in points/lb.

* Base price in Cents/lb.

2006 Beltwide Cotton Conferences, San Antonio, Texas - January 3 - 6, 2006

Table 3. 2004/05 Weighted Average Price Estimates from DPES, East Texas/Oklahoma

		Color Grade and Staple Premiums and Discounts											
		Staple Length											
		28	29	30	31	32	33	34	35	36	37	38	
C o l o r	11	-517	-384	-261	-150	-53	30	97	147	180	195	195	
	21	-579	-447	-327	-218	-122	-41	24	74	106	121	121	
	31	-610	-480	-361	-253	-158	-78	0	36	68	83	83	
	41	-673	-545	-428	-323	-230	-151	38.93*	0	0	7	7	
	51	-769	-646	-532	-430	-339	-263	-201	-155	-124	-110	-110	
	61	-947	-831	-723	-627	-542	-470	-411	-367	-339	-325	-325	
	71	-1148	-1039	-939	-849	-770	-703	-648	-607	-581	-568	-568	
	12	-687	-560	-443	-338	-245	-167	-103	-56	-24	-10	-10	
	22	-687	-560	-443	-338	-245	-167	-103	-56	-24	-10	-10	
	32	-714	-588	-473	-368	-277	-199	-136	-89	-58	-43	-43	
	42	-746	-621	-507	-404	-313	-236	-174	-127	-96	-82	-82	
	G	52	-867	-747	-637	-538	-450	-376	-316	-271	-242	-228	-228
	r	62	-1011	-897	-792	-697	-614	-544	-487	-444	-416	-403	-403
	a	23	-853	-732	-622	-522	-434	-360	-300	-254	-225	-211	-211
	d	33	-853	-732	-622	-522	-434	-360	-300	-254	-225	-211	-211
	e	43	-901	-783	-674	-576	-490	-416	-357	-313	-283	-270	-270
		53	-923	-805	-697	-600	-514	-441	-383	-338	-309	-296	-296
	63	-1183	-1076	-977	-888	-810	-744	-690	-650	-623	-611	-611	
	34	-1072	-960	-857	-765	-684	-615	-559	-517	-489	-476	-476	
	44	-1258	-1154	-1058	-972	-896	-831	-779	-740	-714	-702	-702	
	54	-1287	-1184	-1089	-1003	-928	-864	-813	-774	-748	-736	-736	
Micronaire Differences		Leaf Grade Differences				Uniformity Differences			Strength Differences				
Mike Range		Disc		Leaf Grade		Prem./		Disc./		Grams/Tex.		Disc./	
<24		-660		Leaf Grade		Disc.		Uniformity		Prem		Grams/Tex.	Disc./
25 - 26		-560		1		49		<77		-28		<18	--
27 - 29		-408		2		49		78		-21		19	--
30 - 32		-252		3		47		79		-14		20	--
33 - 34		-149		4		0		80		-7		21	--
35 - 49		0		5		-89		81		0		22	-208
50 - 52		-205		6		-219		82		7		23	-157
>53		-298		7		-383		83		14		24	-111
		Level 1		Level 2				84		--		25	-72
Bark		-223		-1821				85		--		26	-38
Preparation		-1320		-1320				>86		--		27 - 28	0
Other Ext. Matter		-1423		-1423								29	23
												30	12
												31 - 32	12
												>33	12

All Premiums and discounts are expressed in points/lb.

* Base price in Cents/lb.

Patterns of Premiums and Discounts

This section summarizes the average premiums and discounts for each quality attribute during the 2004/05 marketing year. It also provides a comparison of the 2004/05 and 2003/04 marketing years to identify whether there were changes in premiums and discounts of each quality attribute. The premiums and discounts for quality characteristics associated with the West Texas spot market are presented.

Leaf Grade

Two general patterns are observed for the daily premiums for leaf grade 3. From early November through mid-January, leaf grade 3 premiums exhibit a downward trend; declining from 160 to 25 points/lb. From mid-January through the end of the marketing year, leaf grade 3 premiums, for the most part, fluctuated between 50 and 100 points/lb. Leaf grade premiums and discounts for the West Texas market in the 2004/05 marketing year were compared with the 2003/04 marketing year (Figure 3). The results show that premiums for low leaf grade and discount for high leaf grade were lower in the 2004/05 marketing year.

Color Grade

Although the discounts for color grade 42 fluctuated considerably between early November and end of March, most of the daily discounts were between 100 and 300 points/lb. Color grades 1 and 2 received premiums amounting to 97 and 24 points/lb, respectively. First digit color grades 3, however, did not receive any premiums in the 2004/05 marketing year. Color grade 5 received discounts similar to its level in the 2003/04 marketing year; however, first digit color grade 6 was less discounted in the 2004/05 marketing year compared to the 2003/04 marketing year (Figure 4). Discounts for the second digit color grade 2 and 3 were similar in the 2004/05 and 2003/04 marketing years. However, second digit color grade 4 was less severely discounted in 2004/05. Thus, increased levels of yellowness were less severely discounted in the 2004/05 marketing year than in the 2003/04 marketing year (Figure 5).

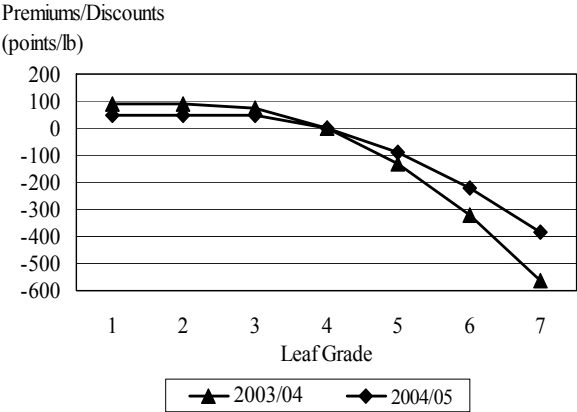


Figure 3. Leaf grade Premiums/Discounts for the 2003/04 and 2004/05 Marketing Years, West Texas.

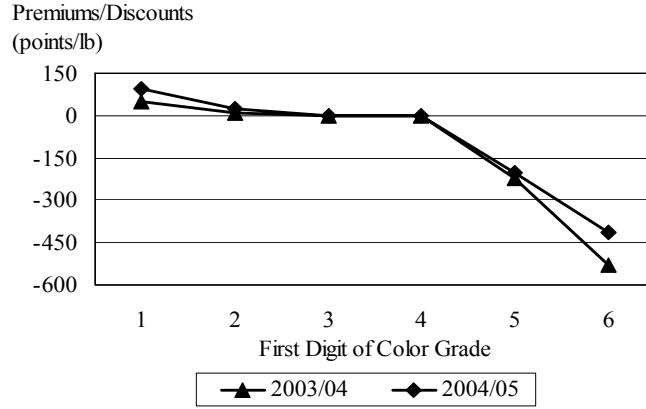


Figure 4. First Digit of the Color Grade Premiums/Discounts for the 2003/04 and 2004/05 Marketing Years, West Texas.

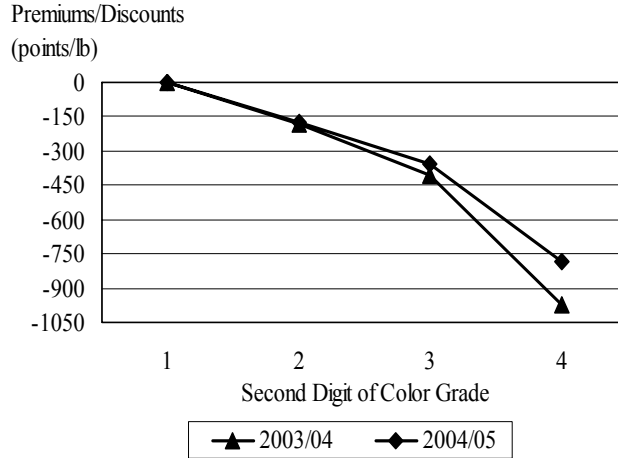


Figure 5. Second Digit of the Color Grade Discounts for the 2003/04 and 2004/05 Marketing Years, West Texas.

Staple

The discounts for staple length 33 for the 2004/05 marketing year fluctuated, for the most part, between 100 and 300 points/lb. There were some occasional spikes with no noticeable trend throughout the marketing year. In regards to premiums and discounts, lower staple length levels (below the base) were slightly less discounted in 2004/05 than in 2003/04, while higher staple length levels received very minimal to no premium in the 2004/05 marketing year (Figure 6). This may indicate that the market expectation for the base characteristic for staple is shifting due to pressure from the global cotton market.

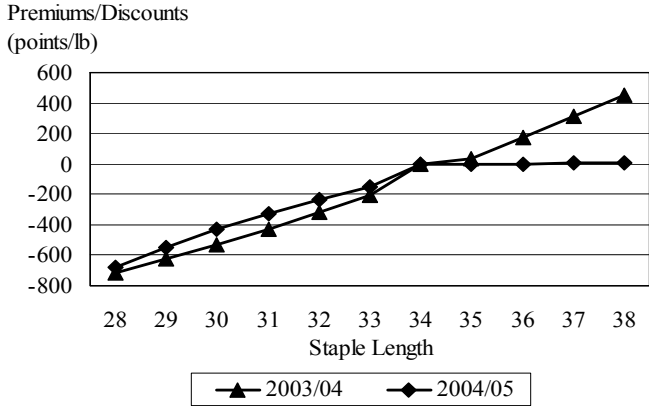


Figure 6. Staple Length Premiums/Discounts for the 2003/04 and 2004/05 Marketing Years, West Texas.

Strength

As illustrated in Figure 10, strength 26 discounts generally fluctuated between 20 and 80 points/lb for the 2004/05 marketing year. Compared to the 2003/04 marketing year, lower strength levels (below 27-28 gram/tex.) were severely discounted in 2004/05 (Figure 7). Similar to previous years, premiums for higher levels of strength continued the trend of seeing minimal premiums.

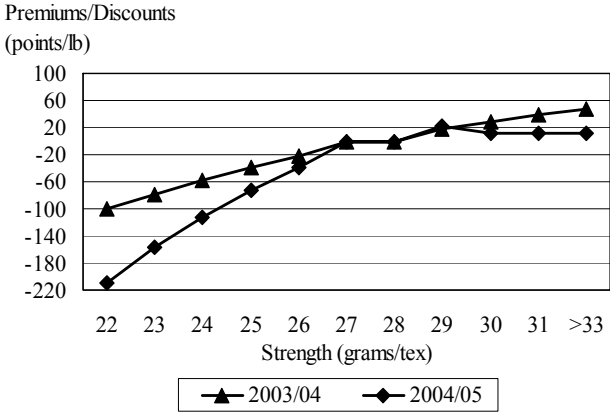


Figure 7. Strength Premiums/Discounts for the 2003/04 and 2004/05 Marketing Years, West Texas.

Micronaire

Despite some occasional lows, discounts for micronaire 3.35 generally fluctuated between 100 and 200 points/lb. Micronaire 3.35 discounts exhibited a slight downward trend between mid-November and end of December followed by a period of no noticeable trend from mid January to the end of the marketing year. Compared to the 2003/04 marketing year, micronaire was less severely discounted both above and below the base level (Figure 8).

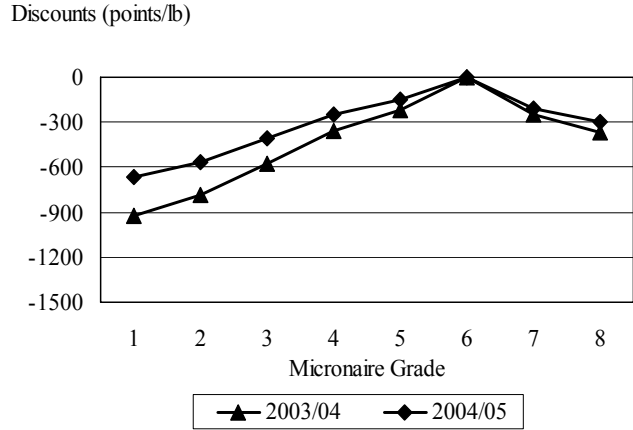


Figure 8. Micronaire Discounts for the 2003/04 and 2004/05 Marketing Years, West Texas.

Bark

Discounts for level 1 bark in the 2004/05 marketing year generally fluctuated between 150 and 300 points/lb. Compared to the previous marketing year, discount for level 1 bark in 2004/05 was, on average, 130 points lower (Figure 9).

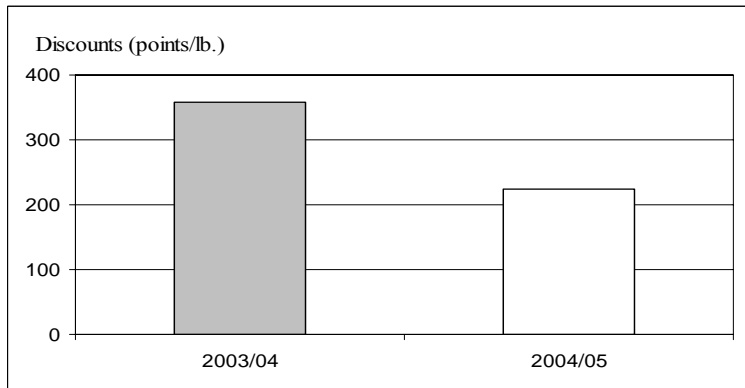


Figure 9. Bark Discounts for the 2003/04 and 2004/05 Marketing Years, West Texas

Uniformity

Uniformity 80 discounts in the 2004/05 marketing year in general fluctuated between 10 and 60 points/lb. with no particular pattern. Compared to the previous marketing year, uniformity level below the base value was more severely discounted in 2004/05. Uniformity level above the base value received higher premiums as well in 2004/05. Overall, uniformity had more impact on cotton price in West Texas in the 2004/05 marketing year compared to previous years (Figure 10).

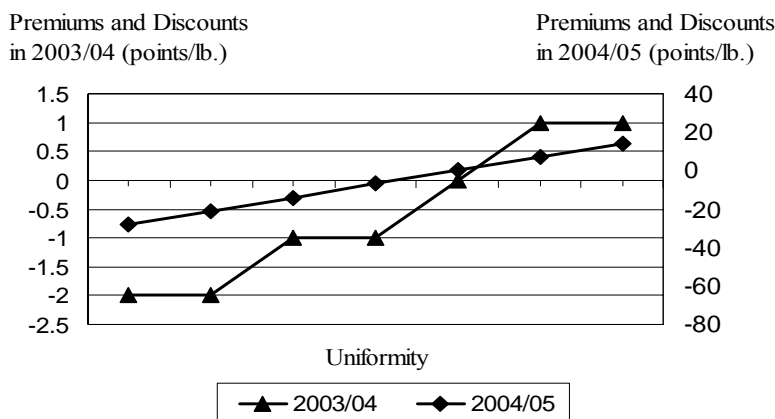


Figure 10. Uniformity Discounts for the 2003/04 and 2004/05 Marketing Years, West Texas.

Other Extraneous Matter and Preparation

As indicated in Table 1, the percentage of level 1 and level 2 other extraneous matter and preparation remained below the 1 percent level in the 2004/05 marketing year. The low incidence of other extraneous matter and preparation makes it difficult to interpret and draw conclusions on the patterns of these attributes.

Conclusion

The analysis of the 2004/05 marketing year shows that cotton price fell below the price in 2003/04. The average spot price for the 2004 crop was 36.42 cents/ pound, about 43 percent lower than the 2003/04 price level. Total sales and total bales for both regions increased compared to the previous year, from 5,860 to 10,603 and from 531,844 to 1,150,155, respectively. Most of the increase in total bales sold originated from the West Texas region. The average price was relatively low compared to its 2003/04 level. This may be explained by several reasons, including higher sales volume and a decline in overall quality characteristics.

For the 2004/05 marketing year, the results indicated lower premiums for low leaf grade, higher staple length, and higher strength. However, relatively higher premiums were observed for higher color grade and higher level of uniformity. Premium levels for better than base quality first digit color grade and strength appear to be very minimal to nonexistent. Price discounts in 2004/05 for staple length, first and second digit color grade, and bark either remained unchanged or decreased, while discounts for micronaire, strength, and uniformity increased compared to the 2003/04 levels.

References

- Brown, J.E. and D.E. Ethridge. "Functional Form Model Specification: An Application to Hedonic Pricing." *Agricultural and Resource Economics Review*. 24(2), 1995: 166-173.
- Brown, J.E., D.E. Ethridge, D. Hudson, and C. Engles. "An Automated Econometric Approach for Estimating and Reporting Daily Prices." *Journal of Agricultural and Applied Economics*. 27(2), 1995: 409-422.
- U.S. Department of Agriculture (USDA). *The Classification of Cotton*. Washington, DC: USDA, Agricultural Marketing Service, Agricultural Handbook 566, September 1995.

Appendix A: The DPES Model and Yearly Parameter Estimates

The Daily Price Estimation System is a computerized econometric model based on the theory of hedonic price analysis (Brown and Ethridge, 1995). The premise of this approach is that the value of a commodity is determined by the value of the utility bearing characteristics that comprise the commodity. The implicit prices of these characteristics may be determined by disaggregating the price of the commodity into its measurable characteristic

components. In the DPES, the relationship between the price of cotton and its various measurable quality attributes is estimated using a nonlinear regression model. The equation used for regression analysis is:

$$P = \exp \left(\begin{array}{l} \beta_0 + \beta_1 LF + \beta_2 LF^2 + \beta_3 RD + \beta_4 RD^2 + \beta_5 PB + \beta_6 PB^2 + \beta_7 UNI + \beta_8 STA + \\ \beta_9 STA^2 + \beta_{10} STR + \beta_{11} STR^2 + \beta_{12} M + \beta_{13} M^2 + \beta_{14} LB + \beta_{15} LB^2 \\ + \beta_{16} HB + \beta_{17} LO + \beta_{18} HO + \beta_{19} PRA + \beta_{20} PRB + \beta_{21} R \end{array} \right)$$

The variable definitions and parameter estimates are presented in Appendix Table A1.

At the end of each marketing year, the data for that year are compiled and diagnostic tests are run on the model. The purpose of running diagnostics tests is to detect any systematic error that might have occurred in the DPES, but which remained undetected in the daily diagnostics. The model specification above is the result of the year-end diagnostic analysis for the 2004/05 marketing year. The procedures of Brown et al. (1995) indicated that this model specification best fits the 2004/05 marketing year data. The parameters of the model for the 2004/05 year model were computed by weighting the individual estimates for each day by the number of sales transactions during that day.

Appendix Table A1: Definition of Variables and Parameter Estimates for the 2004/05 Marketing Year Model.
Dependent Variable = Log(Price)

Definition of the Variables	Variables	Parameters	Estimates
Constant term	Const.	β_0	-2.65939
Average leaf grade (1 to 7)	LF	β_1	0.02761
Average leaf grade squared	LF2	β_2	-0.00565
Average reflectance	RD	β_3	0.02134
Average reflectance squared	RD2	β_4	-0.00009
Average yellowness	PB	β_5	0.04657
Average yellowness squared	PB2	β_6	-0.00302
Average staple length (32nds of an inch)	STA	β_7	0.16363
Average staple length squared	STA2	β_8	-0.00219
Average micronaire reading	M	β_9	0.50285
Average micronaire reading squared	M2	β_{10}	-0.06054
Average strength (gram/tex)	STR	β_{11}	0.05257
Average strength squared	STR2	β_{12}	-0.00086
Percentage uniformity length	UNI	β_{13}	0.00182
Percentage of bales classed as level 1 bark	LB	β_{14}	-0.04224
Percentage of bales classed as level 1 bark squared	LB2	β_{15}	-0.01669
Percentage of bales classed as level 2 bark	HB	β_{16}	-0.63046
Percentage of bales classed as level 1 other extraneous matter	LO	β_{17}	-0.41392
Percentage of bales classed as level 2 other extraneous matter	HO	β_{18}	-0.19439
Percentage of bales classed as level 1 preparation	PRA	β_{19}	-0.45491
Percentage of bales classed as level 2 preparation	PRB	β_{20}	-0.28762
Region (R = 0 for West Texas, R = 1 for East Texas and Oklahoma)	R	β_{21}	-0.00387