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Impacts of Quality Characteristics on U.S. Cotton Prices and Value

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Cotton is one of the major agricultural commodities grown in the United States with an annual production value of over 5 billion dollars. US cotton production accounts for about 20% of annual world production. The two major uses of U.S. cotton are domestic mill use and exports. Domestic mill use consumed more than 70% of the U.S. cotton supply until late 1990's. As textile production moved out of the US, however, domestic cotton consumption decreased sharply. The steady fall of U.S. domestic cotton consumption since the late 1990's, has been accompanied by a steady increase in U.S. cotton exports, as foreign textile production has increased. As approximately 70 percent of U.S. cotton production is now exported, U.S. cotton confronts more competition from other cotton exporters and US production must meet international quality standards for cotton.

The Agricultural Marketing Service (AMS) of USDA provides standardization, grading and market news services for cotton and for five other commodities. One aspect of the AMS cotton program is the development of cotton grade standards and cotton classification services. Quality classification is not mandatory but almost all cotton grown in US is classed at the request of the growers who pay the fee for the service. Twelve AMS classing offices are located in nine states throughout the cotton belt. The main fiber measurements included in USDA's official cotton grade include:

1. Color.

Color refers to the gradations of grayness and yellowness and gives an indication of the fibers' ability to accept dyes in the manufacturing process. The grayness (first digit) indicates how bright or dull the sample is and the yellowness (second digit) indicates the

degree of color pigmentation. The color can be affected by rainfall, freezes, insects and fungi, and be stained through contact with soil, grass, or the cotton plant's leaf. Color also can be affected by excessive moisture and temperature levels while cotton is being stored, both before and after ginning.

2. Fiber Length (Staple).

Fiber length is the average length of the longer one-half of the fibers and affects the yarn strength, yarn evenness and spinning efficiency. It is reported both in 100ths and 32nds of an inch. Fiber length is largely determined by variety, but the cotton plant's exposure to extreme temperatures, water stress, or nutrient deficiencies may shorten the length. Excessive cleaning or drying at the gin may also result in shorter fiber length.

3. Leaf Grade.

Leaf grade refers to small particles of the cotton plant's leaf which remain in the lint after the ginning process. Leaf content is affected by variety, harvesting methods, harvesting conditions, and ginning process. Even with the most careful harvesting and ginning methods, a small amount of leaf remains in the cotton lint.

4. Micronaire (Mike).

Micronaire (mike) is the measurement of the fiber fineness and maturity. Micronaire can be influenced by environmental conditions such as moisture, temperature, sunlight, plant nutrients, and extremes in plant or boll population. Fiber fineness affects yarn appearance, yarn uniformity, yarn strength and the quality of the end product.

5. Strength.

The reported strength is the force in grams required to break a bundle of fibers one tex

unit in size. Fiber strength is largely determined by variety, but it also may be affected by plant nutrient deficiencies and weather. Fiber strength is closely related to yarn and fabric strength and to spinning efficiency.

6. Length Uniformity.

Length uniformity is the ratio between the mean length and the upper half mean length of the fibers and is expressed as a percentage. Length uniformity is related to yarn uniformity and strength, spinning efficiency, and short fiber content.

The AMS cotton program provides quality reports which consist of daily, weekly, monthly and annual summaries. All quality reports provide quality characteristic statistics of all bales classed by classing office and by states.

AMS also provides official cotton price reports in the form of daily spot cotton quotations (DSCQ). The daily spot price is the average price over a particular region weighted by the quantity traded at locations within the region. The monthly or annual spot prices are the simple average of the daily cash price for that month or crop year. Monthly and annual cotton price reports provide the estimates of prices and quality premiums and discounts for each month and year. The DSCQ and monthly (annual) cotton price statistics are available for seven regions:

1. Southeast: Alabama, Florida, Georgia, North Carolina, South Carolina, Virginia.
2. North Delta: Arkansas, Tennessee, Missouri.
3. South Delta: Louisiana, Mississippi.
4. East Texas-Oklahoma: East Texas, Oklahoma.
5. West Texas: West Texas except El Paso area.

6. Desert Southwest: Arizona, New Mexico and far West Texas.

7. San Joaquin Valley: San Joaquin valley of California.

The base qualities for the price statistics are color 41, staple 34, leaf 4, mike 35-36 and 43-49, strength 26.5-28.4 and uniformity 81. Based on the price of the base quality, other grades of these quality characteristics received premiums or discounts reported, in 100ths of a cent (e.g. a premium of 100 is a one cent per pound premium). AMS market reporters collect samples of market transactions and conduct interviews with market participants, primarily merchants and marketing organizations, to obtain price information which is used to estimate daily prices and quality premiums and discounts (Brown et al.1995).

Research Objectives

Quality driven price discounts and premiums are dependent on the supply and demand for each quality characteristic. Cotton quality is affected by many factors including variety grown, weather conditions, and production practices. Demand for different quality characteristics is impacted by changes in processing technology and by changes in demand for final products. The objectives of this study are to explore trends in quality premiums/discounts and quality characteristics of US cotton production over the past ten crop years and to examine the relationship between premiums/discounts and production.

Price statistics are reported for seven regions in the US cotton belt. It should be noted that the price statistics may include not only sales from current production but also some sales of cotton carried over from the previous crop year, so prices observed for any

crop year are not solely dependent on production in that year. The crop year is defined as August 1 through July 31 by USDA.

Premiums and Discounts by Quality Characteristics

The annual cotton price statistics for each region provided by USDA AMS consists of 4 main tables. Color, staple and leaf are treated as interdependent quality characteristics and presented in one table. Mike, Strength and Length Uniformity are treated as independent quality characteristics so they appear in three separate tables.

Table 1. Average Quality Characteristics of US Cotton Production, 2003-2005

Color	<u>11&21</u>	<u>31</u>	<u>41</u>	<u>51</u>	<u>42</u>	<u>Total</u>¹
Production %	25.2%	34.8%	25.7%	4.2%	3.7%	93.5%
Staple	<u>33</u>	<u>34</u>	<u>35</u>	<u>36</u>	<u>37</u>	
Production %	11.2%	25.1%	30.0%	18.3%	8.2%	92.9%
Leaf	<u>1&2</u>	<u>3</u>	<u>4</u>			
Production %	13.4%	52.5%	30.1%			96.0%
Mike	<u>35-36</u>	<u>37-42</u>	<u>43-49</u>	<u>50-52</u>		
Production %	4.6%	26.4%	50.8%	8.0%		89.8%
Strength	<u>24-25</u>	<u>26</u>	<u>27-28</u>	<u>29-30</u>	<u>31-32</u>	
Production %	2.7%	6.2%	33.6%	36.1%	14.3%	92.9%
Uniformity	<u>79</u>	<u>80</u>	<u>81</u>	<u>82</u>	<u>83</u>	
Production %	9.1%	21.0%	28.8%	26.3%	10.4%	95.6%

¹Total refers to the percent of US production accounted for by categories in table.

Although there are many possible values and combinations of reported quality characteristics, US cotton production tends to be concentrated in a limited subset of the possible quality grades. Table 1 shows average cotton production by selected quality categories for the three most recent crop years--2003, 2004 and 2005. All categories reported in the table account for about 90% of US production over the past 3 years. In this study, our analysis is mostly concentrated on the quality categories shown in table 1.

Color-Staple-Leaf

There are nine possible categories of staple, six possible categories of leaf and twenty five possible categories of color in the complete price statistics set which cover all possible quality combinations of these three characteristics. The subset of quality categories we discuss here accounts for nearly 90% of total cotton production through the study period including crop years 1996 through 2005. The categories of color, staple and leaf we focus on includes:

Color: 11&21, 31, 41, 51, 42.

Staple: 33, 34, 35, 36, 37.

Leaf: 3, 4.

For the interdependent characteristics of color, staple, and leaf, premiums and discounts for any one of these characteristics vary depending on the value of the other characteristics. In order to present the premiums/discounts for color and staple, the following graphs are arranged by the leaf grade. Figure 1 and figure 2 are graphs of the color premiums/discounts for leaf grades 3 and 4, respectively. Figures 3 and 4 are the graphs of staple premiums/discounts for leaf grades 3 and 4, respectively.

The graphs in figure 1 present the 3 leaf average annual color premiums and discounts for 5 different staple lengths for the study period. The graphs are in the order of longer to shorter staple. Colors 11&21, 31 and 41 are the better colors and are more valuable. For 3 leaf cotton, colors 11&21, 31 and 41 received premiums when staple length was greater than 33. Colors 51 and 42 received discounts for all staple lengths. In general, for all colors here, the premiums (discounts) have had similar increasing (decreasing) trends through the study period with the lowest point in crop year 1996 and the highest point in crop year 2005. The trends are stronger for better color (11&21, 31 and 41) and higher staple. The stronger trends for better colors indicate that the better colors have become more desired through the study period. Discounts for lower quality colors are greater for shorter staple lengths, but all lower quality color discounts in figure 1 are smaller in the post 2000 period than they were before 2000.

Color premiums are highest for longer staple length cotton and color premiums have risen more for longer staple lengths. As figure 1.a shows, the 3 leaf premiums for color 31 have increased more for longer staple cotton. Since the premiums increase more for better color as well as for longer staple, the largest increases in color premiums occurred for the combination of color 11&21, leaf 3 and staple 37.

In term of magnitudes of premiums, in 2005 3 leaf color 11&21 and 31 premiums ranged from between 2.5 and 3 cents per pound for staple 34 to approximately 6 to 7 cents a pound for staples 36 and 37.

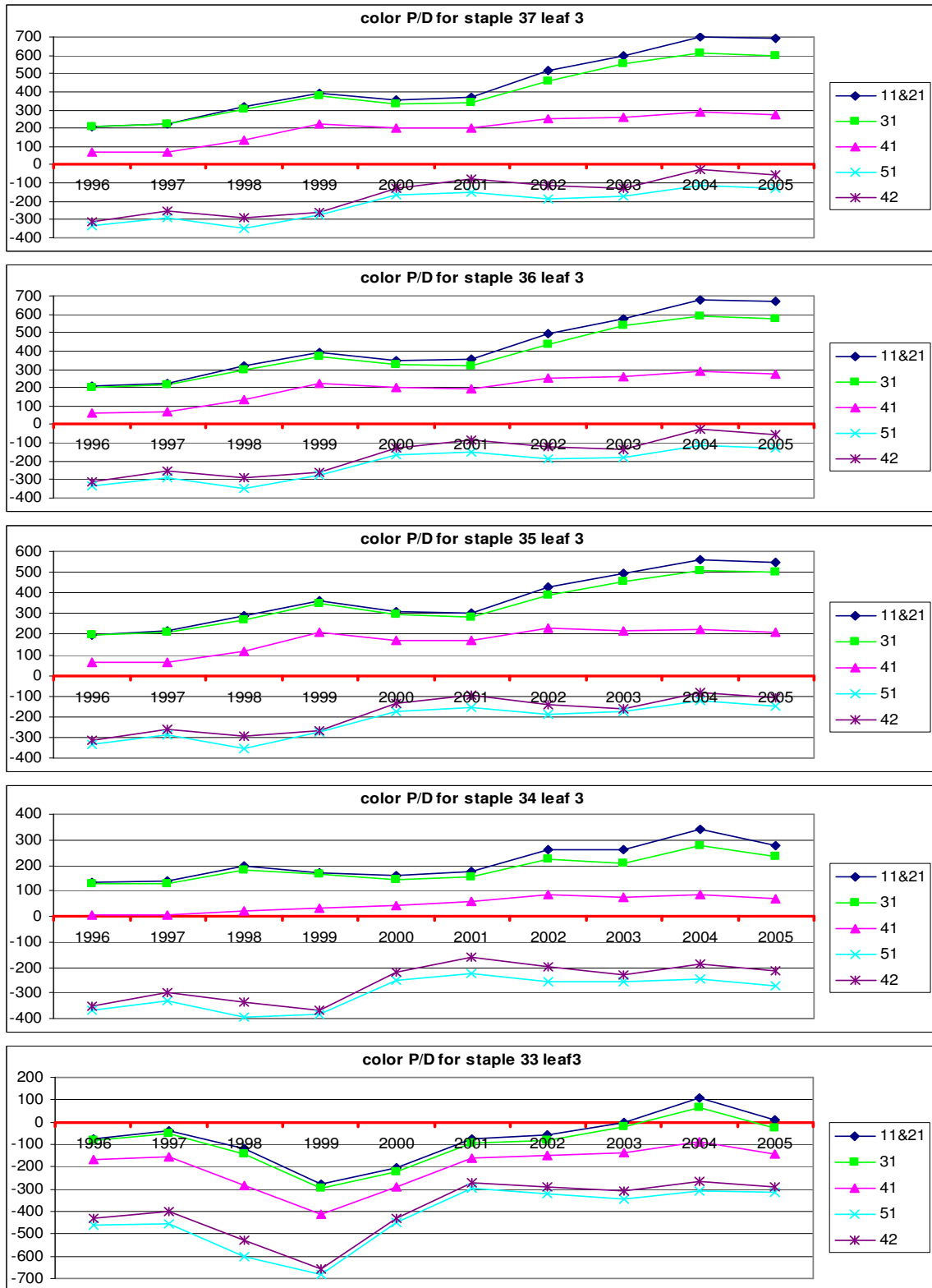


Figure 1. Color Premiums/Discounts for 3 Leaf Cotton, 1996-2005

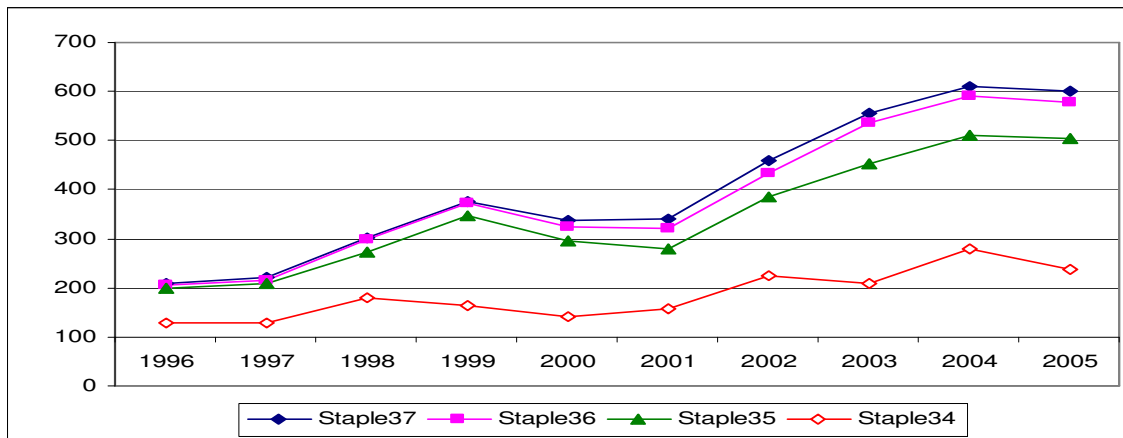


Figure 1.a. Premiums for Color 31, 3 Leaf Cotton, 1996-2005

The graphs in figure 2 present the 4 leaf color premiums and discounts for 5 different staples, and reveal a similar pattern of premiums and discounts as the 3 leaf graphs in figure 1. The only difference between figure 1 and figure 2 is the leaf grade which is 3 for figure 1 and 4 for figure 2. In general, the premiums (discounts) for 3 leaves are larger (smaller) than the premiums and discounts for 4 leaves since leaf grade 3 is more valuable than leaf grade 4. Colors 11&21, 31 and 41 received premiums when staple is greater than the base value of 34 and received discounts when staple is below 34. Colors 51 and 42 received discounts for all staples when leaf is 4. In general, for all colors here, trends in premiums and discounts were the same for 4 leaf cotton as trends for 3 leaf cotton.

In terms of magnitudes, 4 leaf color 11&21 and 31 cotton had premiums of about a penny a pound for staple 34 and between 3.5 and 4.5 cents per pound for staples 36 and 37. Four leaf cotton premiums for 11&21 and 31 colors were therefore 1.5 to 2 cents lower than 3 leaf premiums for 34 staple cotton and about 2.5 cents per pound lower for staple 36 and 37.

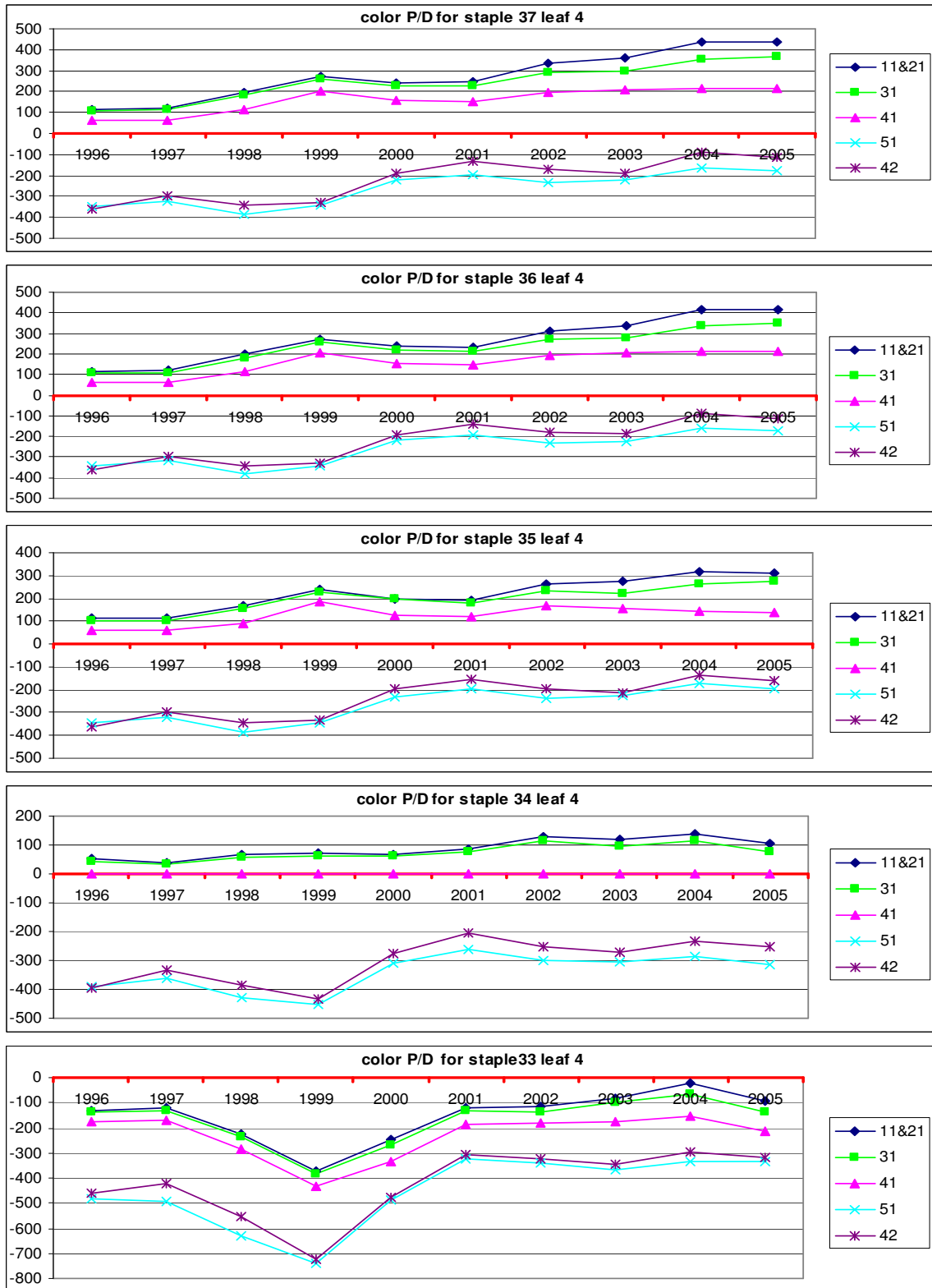


Figure 2. Color Premiums/Discounts for 4 Leaf Cotton, 1996-2005

The graphs in figure 3 present the 3 leaf staple premiums and discounts for 5 different color grades for the study period. The graphs are in the order of better to worse color. Staples 34, 35, 36, and 37 received premiums while staple 33 received discounts when color was 11&21, 31 or 41. All of these staples received discounts when color was 51 or 42, although the discounts were smaller for longer staple cotton and the discounts decreased over time. In general, for staples 34 to 37, the premiums have a similar increasing pattern with the lowest point in crop year 1996 and the highest point in crop year 2005. The premiums of staples 37, 36 and 35 have somewhat stronger upward trends over the study period while the trend for staple 34 is flatter. The stronger premium increase trends for the longer staples with color 41 or better indicate that the longer staples became more desirable through the study period.

Staple premiums are highest for better color cotton and staple premiums have risen more for better colors. As figure 3.a shows, the premiums for staple 36 and leaf 3 are higher and have increased more for the superior color grades. A similar pattern can be observed for other staple lengths and leaf counts.

In terms of magnitudes, 2005 premiums for 3 leaf staple 35 range from about 2 cents a pound for color 41 to 5.5 cents a pound for color 11&21. Similar premiums for staples 36 and 37 were about 3 cents per pound for color 41 and about 7 cents per pound for color 11&21.

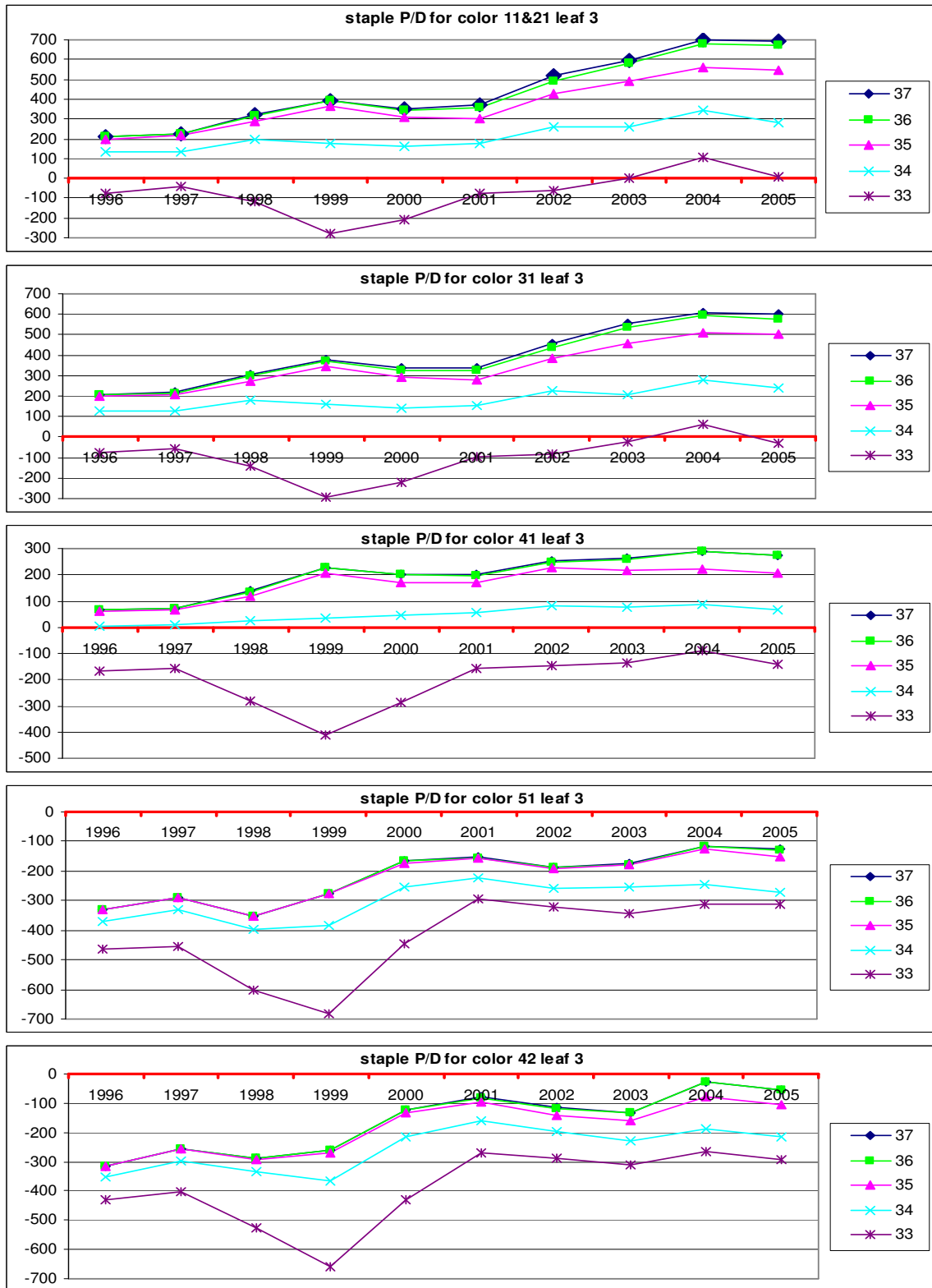


Figure 3. Staple Premiums/Discounts for 3 Leaf Cotton, 1996-2005

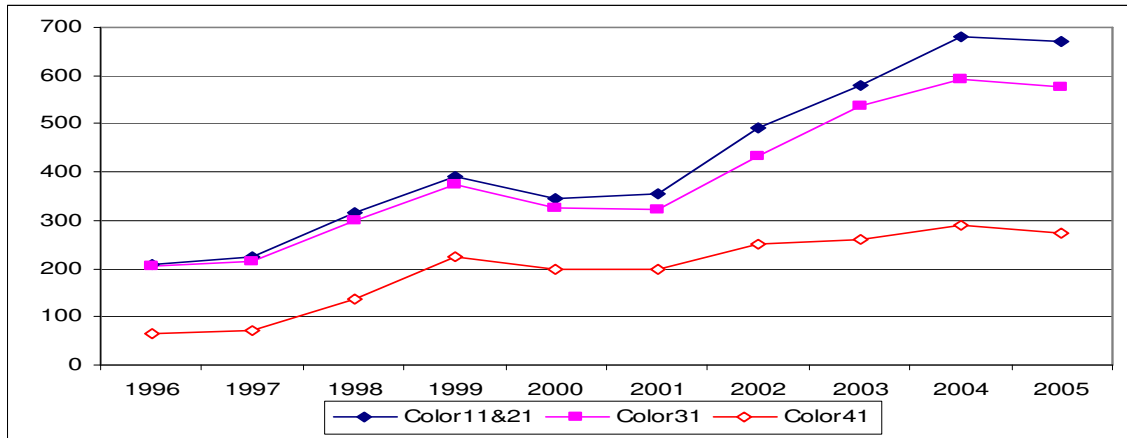


Figure 3.a. Premiums for Staple 36, 3 Leaf Cotton, 1996-2005

The graphs in figure 4 present the 4 leaf staple premiums and discounts for 5 different color grades. The graphs are in the order of better to worse color. The only difference between the figure 3 and figure 4 is the leaf grade which is 3 for figure 3 and 4 for figure 4. Similar to figures 1 and 2, the premiums (discounts) for 3 leaves are larger (smaller) than for 4 leaves since leaf grade 3 is more valuable than leaf grade 4. Staples 35, 36, and 37 received premiums when color is 11&21, 31 or 41. Corresponding with the base quality for the pricing, there were no premiums or discounts for staple 34, color 41, and leaf 4. Staple 33 received discounts regardless of color. When color was 51 or 42, all staples received discounts. Trends in premiums and discounts for 4 leaf cotton were similar to those discussed for 3 leaf cotton.

In terms of magnitude, staple 36 and 37 cotton with color 11&21 received a premium of about 7 cents per pound with a 3 leaf rating. For 4 leaf cotton, this premium is only 4 to 4.5 cents per pound. Similar drops in premiums for 4 leaf versus 3 leaf can be observed in figures 3 and 4.

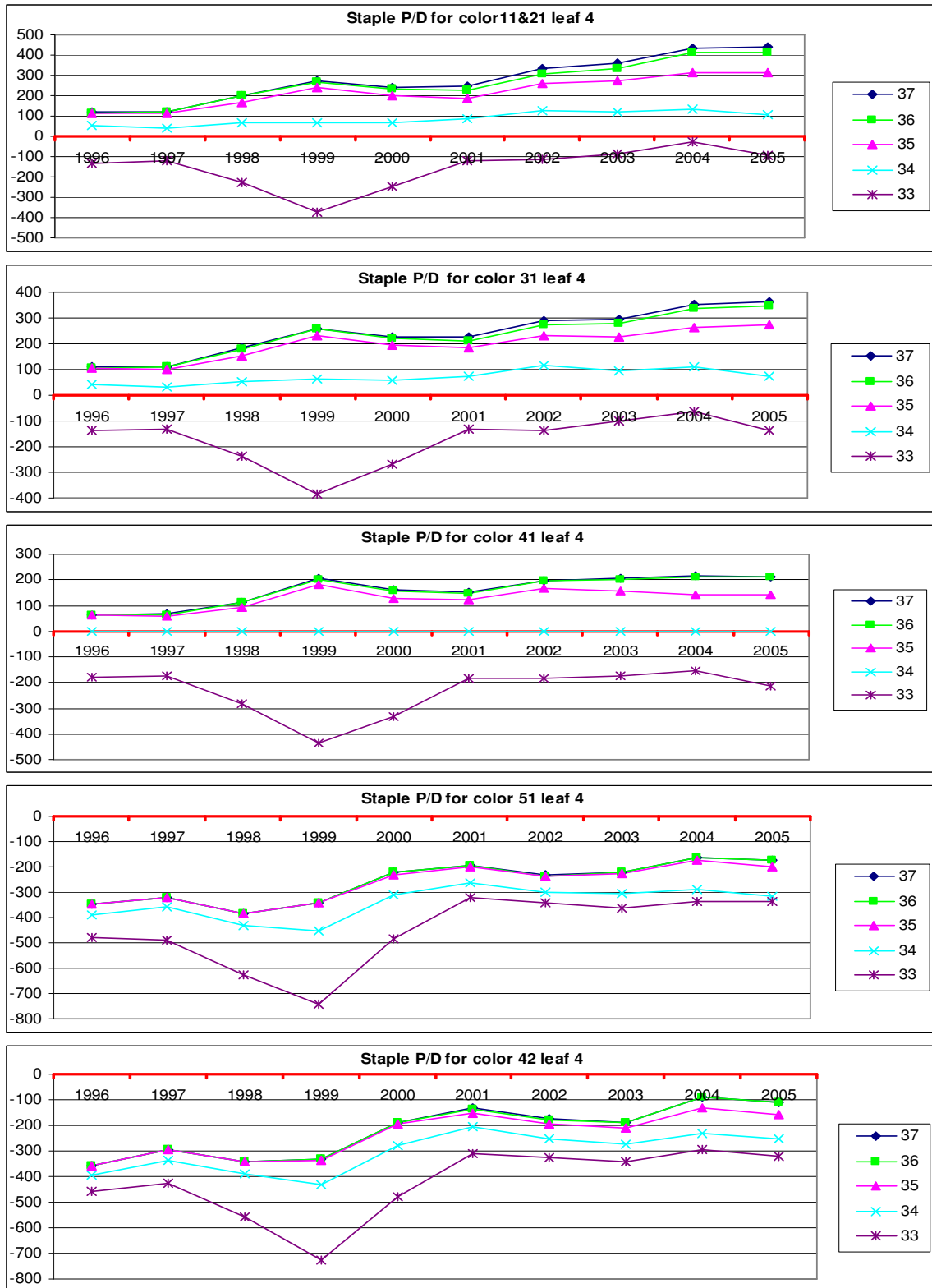


Figure 4. Staple Premiums/Discounts for 4 Leaf Cotton, 1996-2005

Leaf

A comparison of figures 1 and 3 with 2 and 4 reveals the difference between 3 and 4 leaf premiums for all color and staple combinations discussed here. It was observed for color and staple that premiums for high quality in one characteristic are greater when combined with high quality in another characteristic. As shown in figure 5, this relationship also holds true for premiums for 3 leaf cotton over the base 4 leaf quality standard. For colors 11&21 and 31 and staples 35 through 37, 3 leaf cotton has had about a 2.5 cent premium over 4 leaf cotton for the most recent 3 years. These 3 leaf premiums were around 1 cent per pound from 1996 to 2001, but have risen steadily since then.

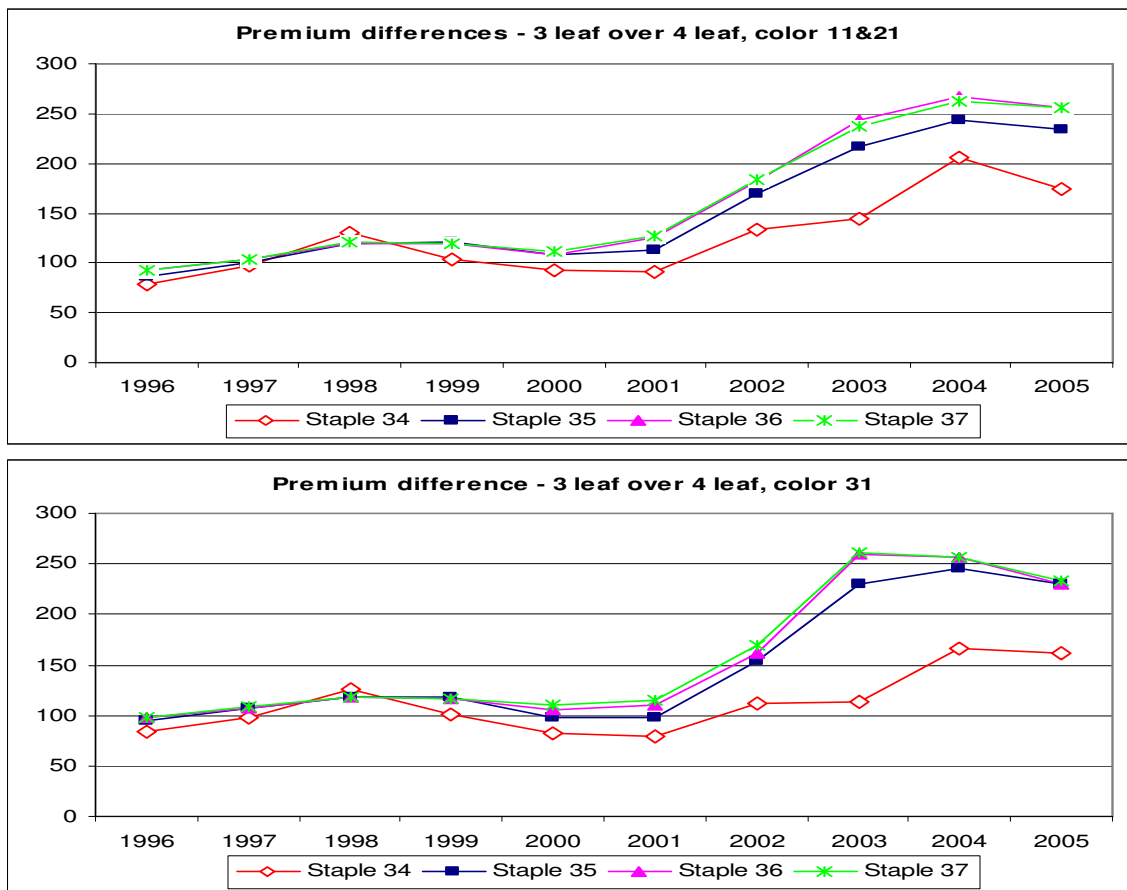


Figure 5. Premium Differences Between 3 Leaf and 4 Leaf, 1996-2005

The 3 leaf premium for colors 11&21 and 31 and staple 34 is smaller than that for the longer staples, with a premium of 1.5 to 2 cents for color 11&21 in the most recent three years, and somewhat less for color 31. Premiums for color 41 were less than 1 cent for all staple lengths, 34-37, throughout the data period.

Mike

The base mike for pricing is 35-36 and 43-49. Between these two base ranges, mike 37-42 is a quality range with premiums. Lower than mike 35 or higher than mike 49 are the quality ranges with discounts. Figure 6 shows the premiums and discounts for different mike ratings through the study period. The discounts for low mike (lower than 35) tends to become smaller from crop year 1996 to crop year 2005. Premiums for mike 37-42 are small and stable in scale. Discounts for high mike (higher than 49) became larger from crop year 1996 to crop year 1999, and then became smaller through the rest of the study period to reach the smallest point at the end of the study period, crop year 2005. Although the magnitude of the discounts for low mike are quite large, production in the lowest mike categories is normally insignificant, as will be shown later. Mike premiums were less than 0.5 cents per pound for the entire data period.

Strength

Strength is reported in term of grams per tex. The base for strength has been changed within the study period. The base strength for pricing was 24-25 prior to crop year 1999. Since crop year 2000, the base strength is 26-27. The first graph in figure 6 illustrates the premiums and discounts for strength with the base strength 24-25 for crop years 1996 to through 1999. Although the base is set as strength 24-25, there was no premium applied

for strength 26-28 within this period. Discounts for lower strength became larger from crop year 1996 to 1999 while premiums for higher strength were stable. The second graph in figure 7 shows strength premiums and discounts with the updated base strength 27-28 for crop year 2000s to 2005. The premiums for higher strength tended to decrease from crop year 2000 to 2003 and became stable from crop year 2003 to 2005. The discounts for lower strengths were generally stable. Magnitudes of all strength premiums were less than 1 cent per pound, 2000-2005, and discounts were greater than 1 cent per pound only for the two lowest strength categories.

Length Uniformity

AMS started to provide premium and discount data for length uniformity for crop year 2000 and has continued to provide these data since then. Although the base for uniformity is 81, uniformity 80 and 82 can also be treated as base since there are no premiums or discounts applied for these two uniformities within the study period. Figure 8 illustrates the premiums and discounts for length uniformity for crop years 2000 to 2005. The discounts for lower uniformity became larger from crop year 2000 to crop year 2005 approximately doubling over this period. Premiums for greater uniformity were generally stable with some minor decreases for some uniformity categories. Uniformity premiums were under 0.5 cents per pounds for all six years, and discounts were all less than a penny a pound over this time period.

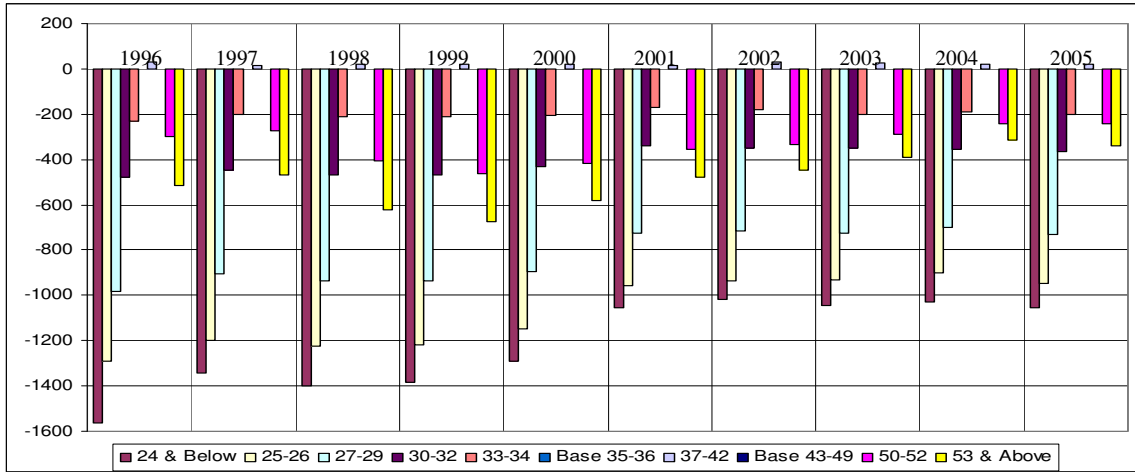


Figure 6. Premiums/Discounts for Mike, 1996-2005

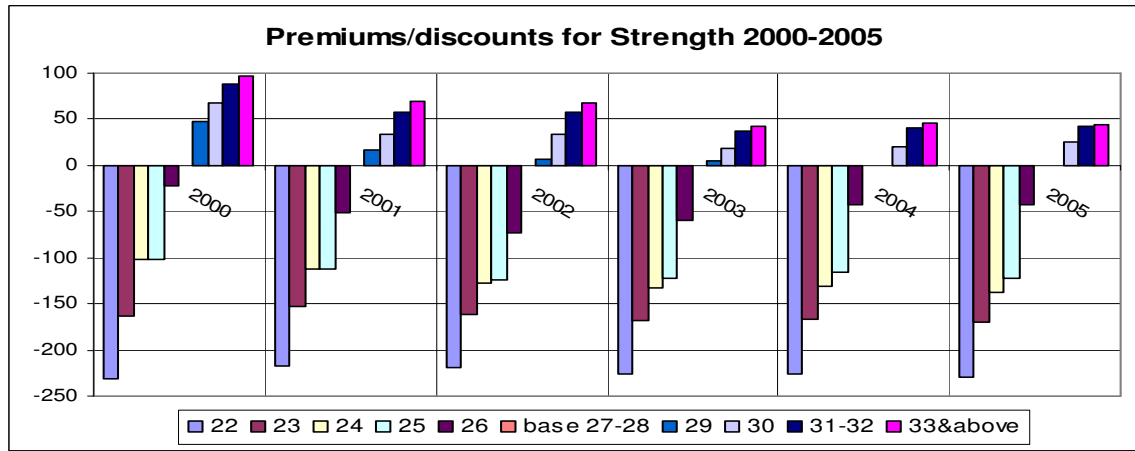
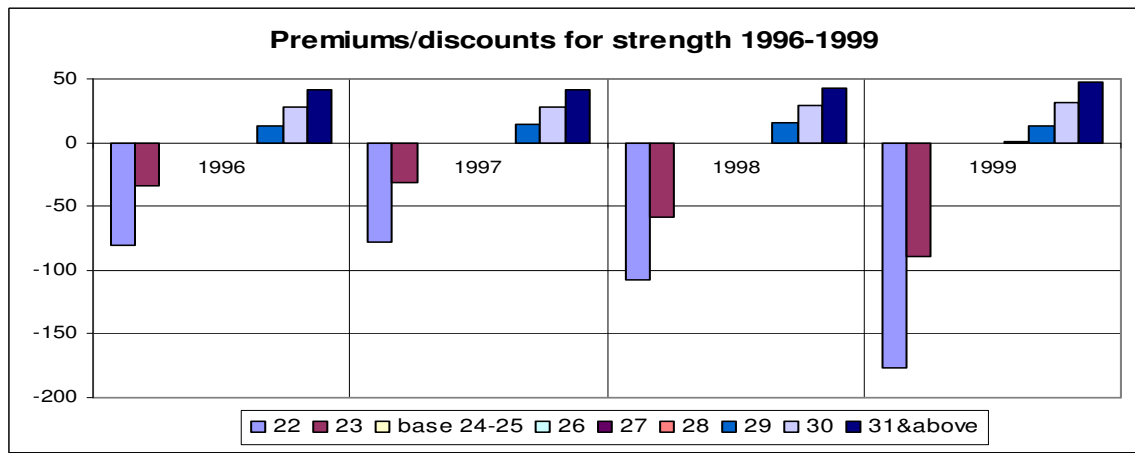


Figure 7. Premiums/Discounts for Strength, 1996-2005

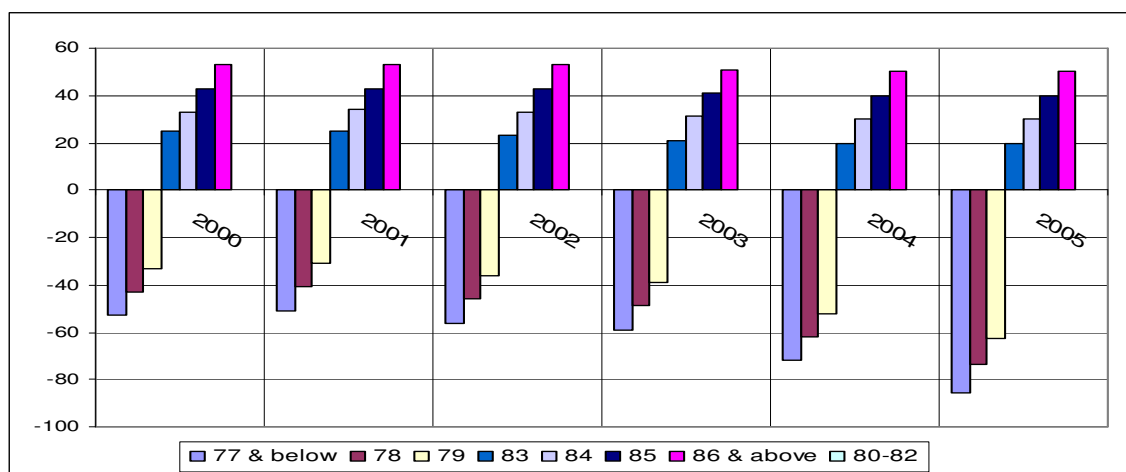


Figure 8. Premiums/Discounts for Length Uniformity, 1996-2005

Production by Quality Characteristics

The annual cotton quality statistics provide number and percentage of classed bales by all quality characteristics at the state level. As was true for the price statistics, color, staple and leaf are treated as interdependent quality characteristics and presented in one table. Mike, Strength and Length Uniformity are treated as independent quality characteristics so they appear in three separate tables. We will first discuss production patterns over time for each characteristic individually, and then examine production of combinations of color and staple characteristics.

Color-Staple-Leaf

US cotton production is concentrated in colors 11&21, 31 and 41 with 70% to 80% of annual production typically having these three colors. As shown in figure 9, annual cotton production of color 11&21 and 31 has some fluctuation within the study period while the production of color 41 is relatively stable. Of colors not shown in figure 9,

colors 32 and 42 are most common, but their production is normally less than 10% of annual production. Production with color 51 and 52 is insignificant for the study period.

US cotton production is spread among the five staple lengths selected in this study. As shown in figure 10, higher percentages of cotton production with staple 35 occurred at the beginning and the end of the study period. In the middle of the study period, the most common staple length produced was staple 34. Production of longer staple lengths 37, 36, and 35 decreased from the beginning of the study period and then slightly increased in recent crop years.

As indicated by figure 11, US cotton production was concentrated in leaf 1&2, 3, and 4 grades with more than 90% of cotton produced with these 4 grades. Leaf 1&2 production has trended downward since 1999 while production of 3 and 4 leaf cotton experienced slightly upward trends since 1999.

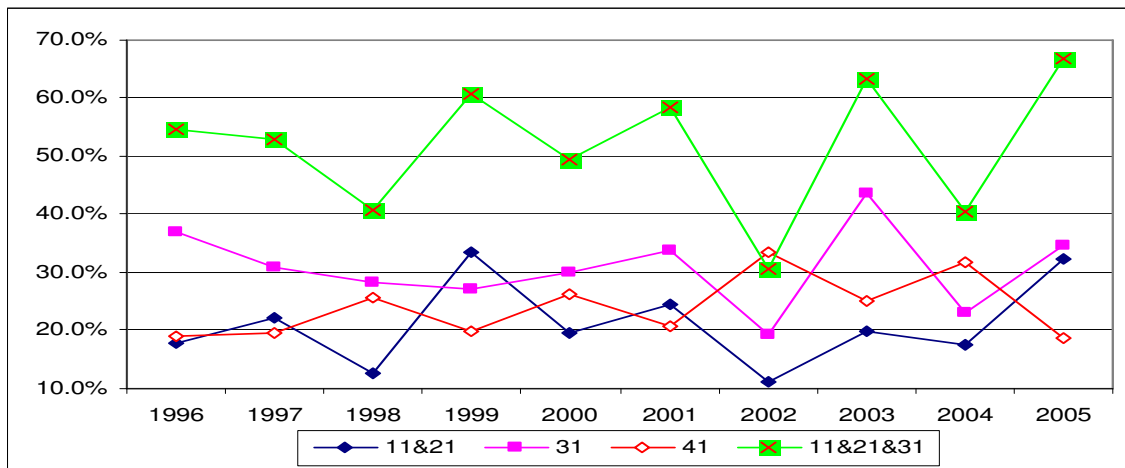


Figure 9. US Cotton Production by Color 11&21, 31, and 41, 1996-2005

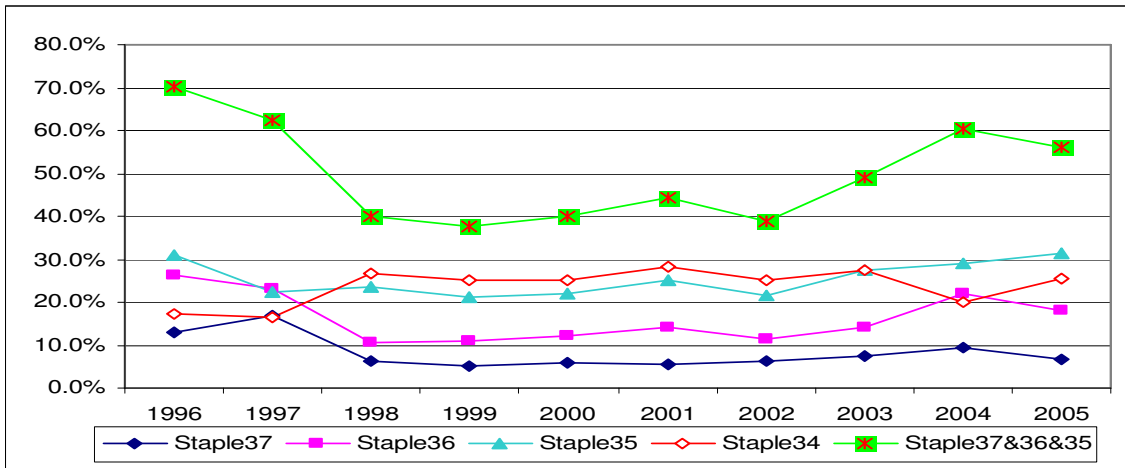


Figure 10. US Cotton Production by Staple 37, 36, 35, and 34, 1996-2005

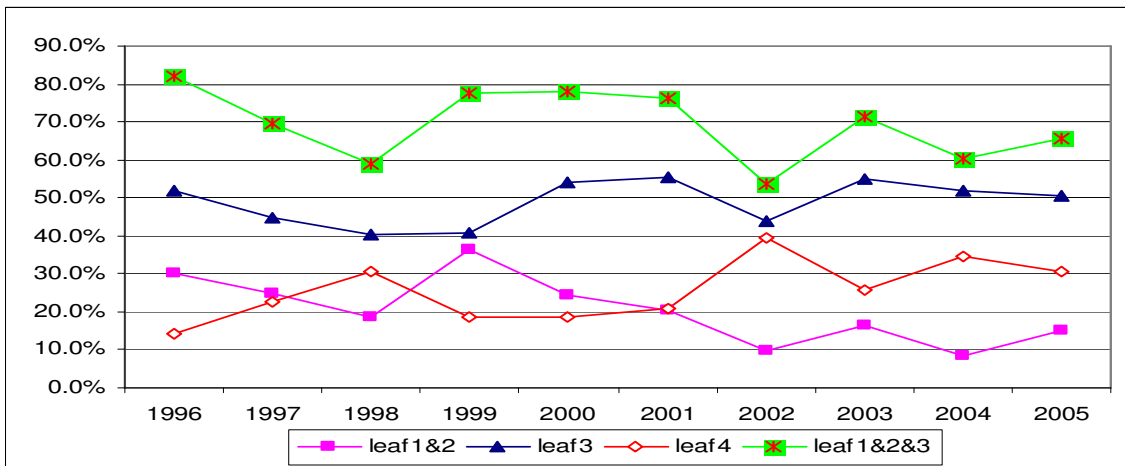
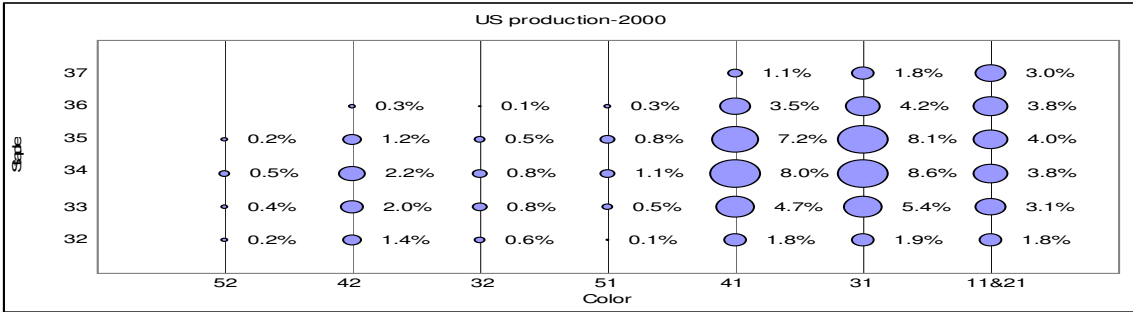
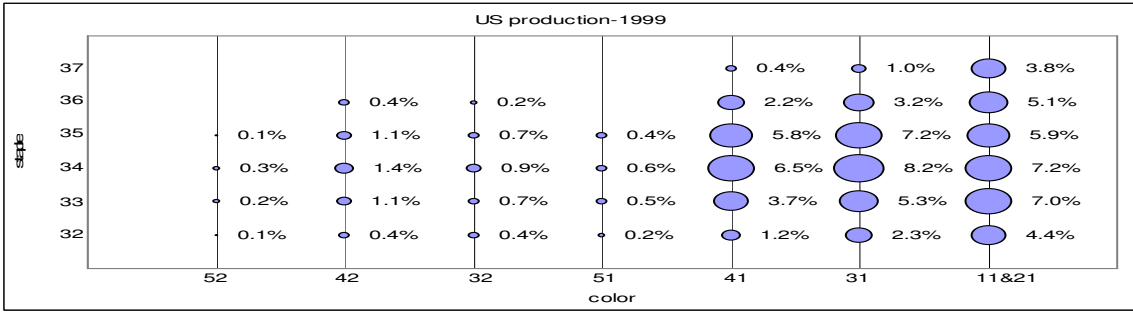
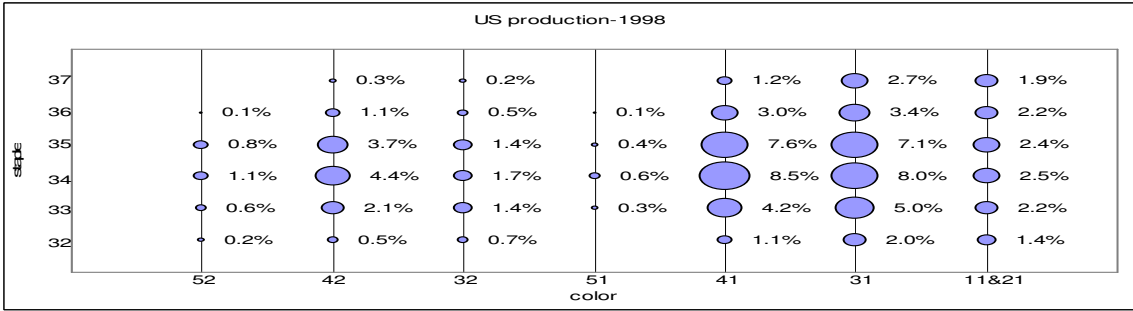
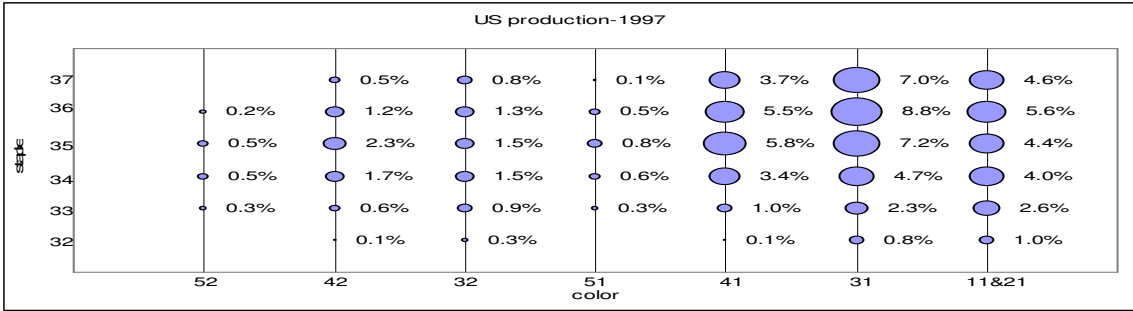
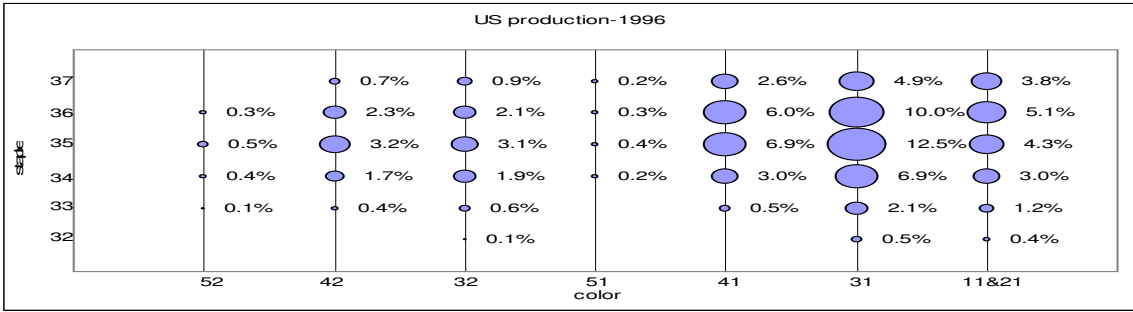


Figure 11. US Cotton Production by Leaf 1&2, 3, and 4, 1996-2005

The bubble charts in figure 12 show annual production percentages for several combinations of staple and color for 1996-2005. These graphs show combined 3 and 4 leaf production percentages for each staple-color combination. The bubble sizes for each graph are proportional to the percentage of production accounted for by each combination, so the annual distribution of cotton production by color and staple is relatively easy to observe in each graph.



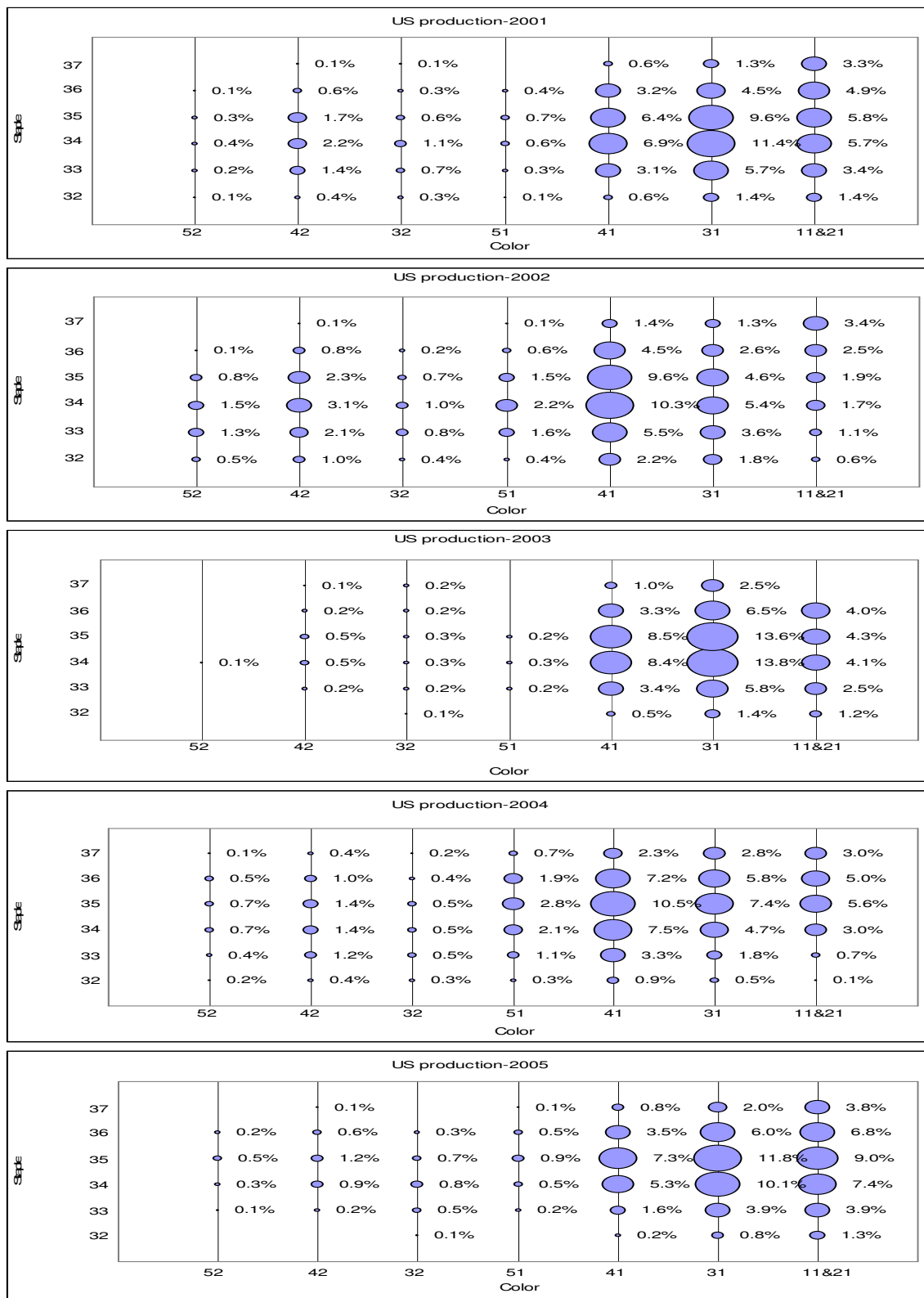


Figure 12. US Cotton Production by Color and Staple, 1996-2005

Although it is difficult to discern production trends in figure 12, it is relatively easy to see individual years with significant deviations from the normal distribution of color and staple – likely due to variations in weather, pest, or disease conditions. Colors 42 and 11-21 stand out as experiencing volatility between years, and 1996 and 1997 stand out as years with high long staple production.

Mike

Figure 13 shows US cotton production by mike through the study period. The mike category with most cotton production is one of the base mike categories 43-49. Combined with the other base-mike 35-36, cotton production with base mike is about 50%-60% of annual US production within the study period. Mike 37-42 received premiums and is the second large mike production category. There is some fluctuation of premium mike production over this ten crop years with the largest percentage of 36.1% (1997) and the smallest 18.5% (2003). In general, these three mike categories account for about 70%-80% of annual production. Cotton production with low mike (lower than 35) was relatively small, usually less than 10%. Cotton production with high mike (higher than 50) ranged from about 7% to 23%.

Strength

The base strength changed within the study period. The first base strength was 24-25 for crop year 1996 to 1999 and the base increased to strength 27-28 for crop year 2000 to 2005. Figure 14.a shows US Cotton production by strength through the study period. The most common strength category produced, accounting for about 30%-40% of production, was for the more recent base strength, 27-28, for all years within the study period.

Although there are some annual fluctuations, figure 14.b shows that production with less than current base strength (lower than 27) tended to increase from the beginning of the study period to crop year 2000, and then decreased gradually to its smallest percentage in crop year 2005. Production with greater than current base strength (stronger than 28) initially decreased and then increased through the study period.

Length Uniformity

Although reporting of premiums and discounts for length uniformity started for crop year 2000, annual cotton quality statistics has reported cotton production by uniformity for all crop years within the study period. Figure 15 shows US cotton production by length uniformity through the study period. Most cotton production was concentrated around the base--uniformity 80, 81 and 82 which account for about 70% of US production annually. Production with higher uniformity (higher than 82) accounted for 10%-20% of US production with a minor decreasing trend through the study period. Production with lower uniformity (lower than 80) ranged from 5% to 17% of US production, with a minor increasing trend through the study period. Overall, the distribution of production by uniformity showed a slight decreasing trend.

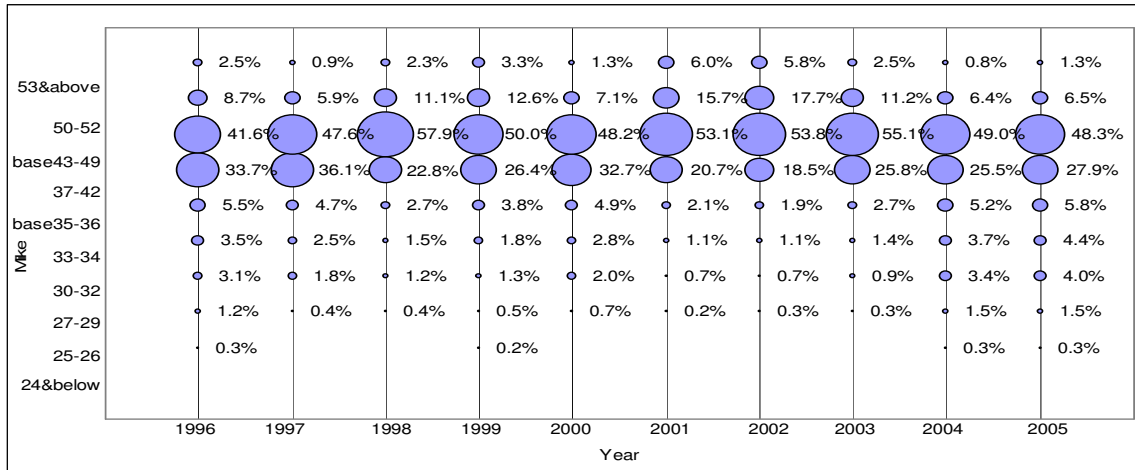


Figure 13. US Cotton Production by Mike, 1996-2005

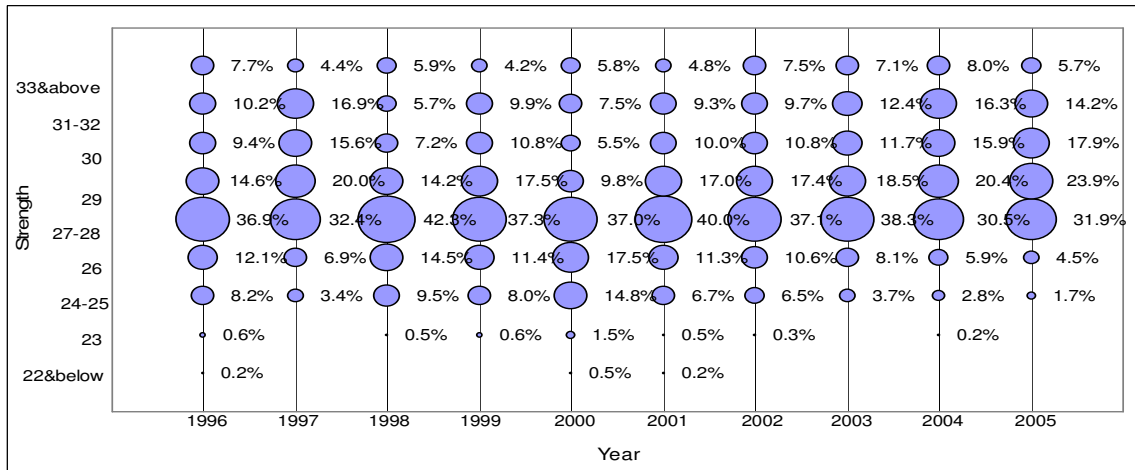


Figure 14.a. US Cotton Production by Strength, 1996-2005

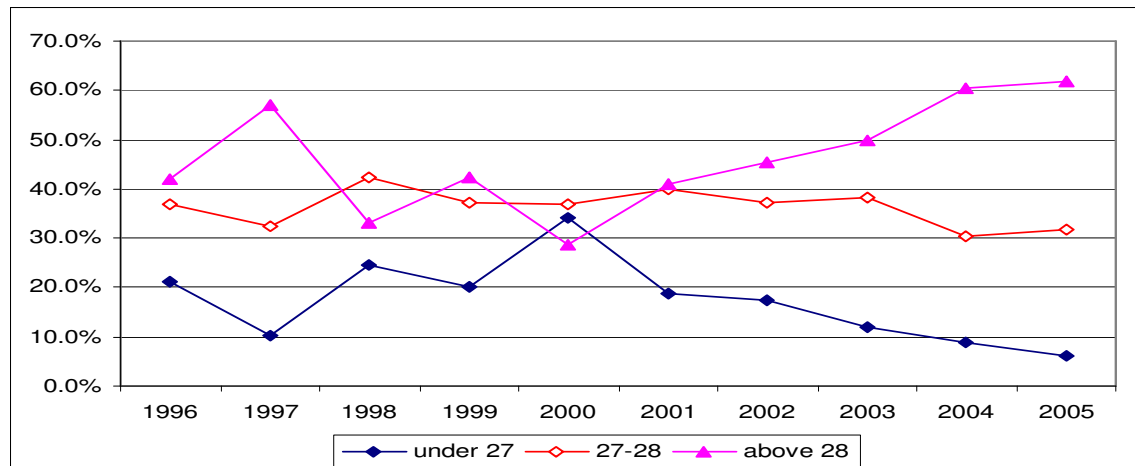


Figure 14.b. US Cotton Production by Strength Categories, 1996-2005

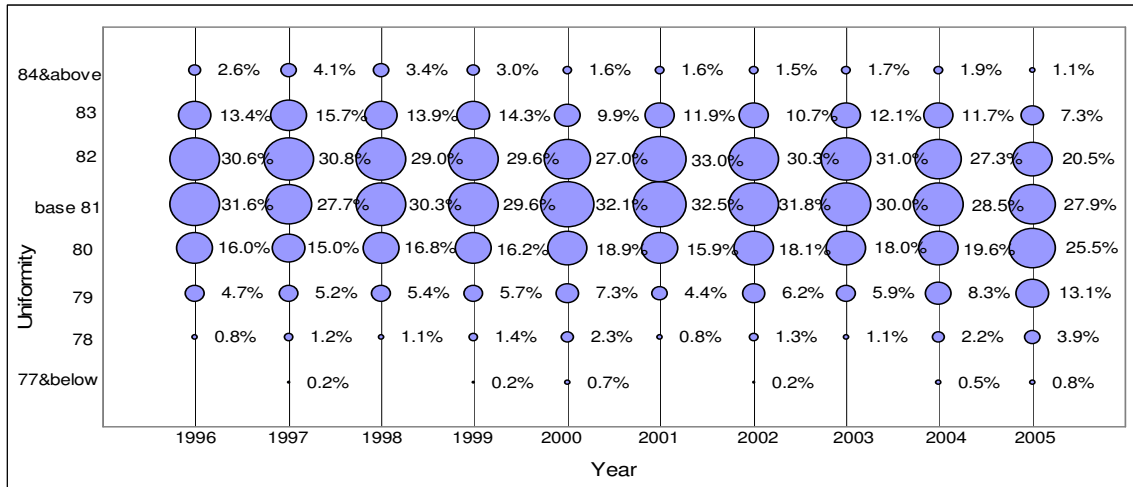


Figure 15. US Cotton Production by Length Uniformity, 1996-2005

Relationship Between Premiums/Discounts and Production

Premiums and discounts for various quality characteristic combinations reflect the supply and demand for cotton with those characteristics. Annual variations in production of cotton with any specific set of qualities, due to weather, pests, or disease, may have short-term impacts on premiums and discounts, but it is often possible to observe either stability or trends in premiums or discounts over time despite these variations.

Stability of premiums and discounts over time indicates a general balance in supply and demand - where prices of higher quality cotton reflect a willingness of the market to pay more for superior characteristics, but where the quantity demanded of that cotton stays generally in line with the supply of that cotton.

Trends in premiums and discounts are evidence of market pressure to produce more or less cotton with certain quality characteristics. Increasing premiums for certain characteristics indicate that demand for cotton with those characteristics is high relative

to its supply, and that the price of that cotton is thus being bid up – relative to the price of base quality cotton. Premiums would be expected to eventually stabilize at some level, however, because final demand limits how high prices will go even if there is no supply response. To the extent that there is a supply response to increase production of cotton with characteristics experiencing rising premiums, the premium may stabilize at less than its maximum level as new supply and demand levels come into a general balance.

Although it is difficult for cotton producers to control production and produce desired quality characteristics in any given year, over time they may be able to respond to the market's demand for quality as expressed through premiums and discounts. Researchers may respond to increasing premiums for a characteristic by developing new varieties more likely to produce that characteristic or by studying the linkages between various production practices and the desired characteristic. Producers may respond by adopting varieties and production practices that, on average, produce more cotton with the desired characteristics - if production costs and possible changes in yields do not offset gains from the premiums.

Production responses to premiums and discounts should be most likely for characteristics with relatively large discounts or premiums, and for characteristics with significant trends in premiums or discounts. In examining premium and discount data for different quality characteristics for the period 1996-2005, it was shown the discounts or premiums for many cotton quality characteristics have been relatively small.

If attention is focused only on quality levels which are normally produced in significant quantities, many premiums and discounts are less than one cent per pound.

Premiums for mike have been under 0.5 cents per pound for the entire data period and discounts for mike have been under 0.5 cents per pound for over 98 percent of cotton produced in each of the ten years in the data period. Strength premiums rose above 0.5 cents per pound for the two highest categories in 2000 and 2001, but production in these categories has been relatively high in recent years and the premium has fallen below 0.5 cents. Discounts for strength grades 24 and 25 have increased since 2000, from about 1.0 cents per pound to 1.2 to 1.5 cents, and production of these grades has fallen to between 1.7% and 3.7% of the crop in the most recent three years. Uniformity premiums have been stable and under 0.6 cents per pound for the 6 years (2000-2005) this premium has been reported. Uniformity discounts have been steadily increasing over these six years, but they are still relatively small, ranging from about 0.6 to 0.8 cents per pound in 2005.

The largest premiums for cotton quality were for combinations of high qualities of color, staple, and leaf. These high value combinations also had the strongest trends with premiums that increased steadily throughout most of the data period. The high quality combination premiums appear to have leveled out from 2004 to 2005, but it is not known whether they will stabilize at this level.

Premiums are expressed relative to the “base” qualities for each characteristic. For color-leaf-staple the base quality values are color 41, leaf 4, and staple 34. The highest premiums were approximately 7.0 cents per pound in 2005 for color 11&21, leaf 3, and staple 37. The premium for this quality bundle was about 2.0 cents per pound in 1996-1997.

Premiums associated with each individual color, leaf, and staple characteristic depend on the quality of all three characteristics combined. Figures 1 through 5 provide extensive detail on levels and trends for premiums associated with several quality combinations. Generally, colors 11&21 and 31 have had 3 to 4 cent premiums over color 41 in recent years. Staples 36 and 37 have had a 2 to 4 cent premium over staple 34 in recent years, and leaf 3 has had a premium of about 2.5 cents per pound over 4 leaf when combined with good color and longer staples. All premiums for these individual characteristics are at their highest when combined with the best grades for the other characteristics.

Production of the highest premium colors, 11&21 and 31 has been erratic over the data period with large year to year changes. As a percentage of production these categories counted for as little as 30 percent of production and as much as 68 percent of production with no clear trend. Production of longer staple cotton (35-37) has trended generally upward from 1998 to 2005, increasing from about 40 percent of production to 50 percent. Leaf 3 production dropped to about 40 percent of the crop in 1998-1999, but has been over 50% in each year, except 2002, since that time.

Figure 16 shows that the production percentage of the 4 highest color-staple combinations has shown an upward trend since 1998, increasing from about 10 percent of production to almost 20 percent.

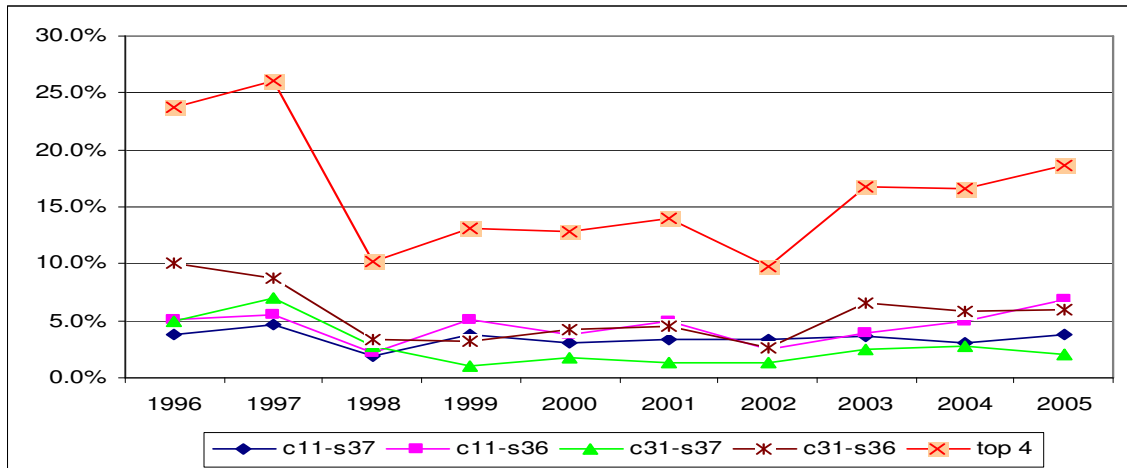


Figure 16. Production of High Premium Color-Staple Combinations, 1996-2005

Conclusions

The interdependence of color, staple, and leaf characteristics in determining cotton prices makes it difficult to discern the rewards and penalties associated with differences in each of these characteristics. In this paper we attempted to clarify these relationships and identify trends and magnitudes of price differentials and production of cotton with selected quality attributes. We found that cotton that combined the highest qualities of color, leaf, and staple not only had the highest price premiums, but had also experienced the largest upward trends in price premiums from 1996 to 2005. There also appears to have been a moderate supply response to increasing premiums for high quality cotton since 1999. The upward trends in high quality premiums and production both correspond to the period of decreased domestic mill use and increased cotton exports.

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