

## MAXIMIZING RETURNS UNDER THE NEW FARM PROGRAM

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### Abstract

The Farm Security and Rural Investment Act of 2002 is considerably different and more complex than previous programs. The new farm bill provides combined payments that add up to a stated safety net target price of 72.4 cents per pound for upland cotton. The provisions, however, are segmented and designed to maintain market-oriented features of past programs. The target price is basically used in calculating other possible payments. Because most program payment components are affected by market price levels, producers will need to become skillful market observers and rely heavily on pricing and “hedging” strategies to enhance income.

Producers have more marketing decisions to make than ever before. Program benefits are impacted substantially by market direction and price changes. When the average price received during the twelve-month marketing season rises above the 52-cent per pound base loan rate, counter-cyclical payments will be reduced and disappear if the price reaches 65.73 cents per pound. Also, cotton must be produced in order to realize a market price, a possible marketing loan benefit or, for base quality, a non-recourse loan rate of 52 cents per pound.

The key to increasing income includes a working understanding of the program provisions (for more details on farm program provisions see [www.usda.gov/farmbill](http://www.usda.gov/farmbill)), as well as forces likely to drive prices higher or lower in the futures and cash markets. The next step is to use appropriate and cost-effective pricing strategies that minimize financial risk and maximize income. Not only protection against lower prices, but also to protect against lower government payments because of higher market prices.

The producer needs to develop a marketing plan that includes “hedging” strategies, mostly using options, to offset expected price changes that reduce income or to benefit from sustained price rallies. That is, seek income from the market that will add to government program payments.

### Introduction

Under the new program’s safety net provisions, producer income is determined by the market price received, potential loan deficiency payments (LDP) or marketing loan gain (MLG), or an alternative Commodity Credit Corporation (CCC) non-recourse loan rate, a counter-cyclical payment (CCP), and a direct payment (DP) (Figure 1).

The new farm bill has a substantially different impact on farm income than past programs. For instance, the market price, LDP, or loan rate when the producer decides to place cotton under the loan program, are linked to annual production on qualified production units. But, the CCP and DP are tied to farm program base acres, two different payment yields and a fixed 85 percent (Figure 2).

The farm program does not guarantee farmers an income based on the 72.4 cent per pound target price. Producers are guaranteed 85 percent of the 6.67 cent per pound DP times their base acres and DP yield. The DP yield was established in 1985 using yields for the 1975-1984 period; thus, they may be far short of actual yields.

If the season average price of cotton received is less than 65.73 cents per pound (72.4-6.67), then producers could receive a CCP. The CCP would equal 65.73 cents minus the higher of the season average market price or the loan rate (52 cents per pound) times the base acres, the CCP payment yield and 85 percent. Beltwide, the CCP payment yield is likely to be about 93.55 percent of average 1998-2001 cotton yields. The CCP and DP yields could be the same if the producer has not elected to update the program yield for CCP purposes.

The direct and CC payments are not tied to current production, so one cannot add the 6.67 cents DP rate to the maximum CCP rate of 13.73 cents and assume farmers receive 85 percent of this value or 17.34 cents on current production. Thus, in Figure 2 and Table 1, the sum of CCP and DP at alternative cotton prices reflects the maximum payment producers may earn per pound if their DP and CCP payment yields equal actual yields and the budget balancing fraction was 100 percent instead of 85 percent.

Remember, payments on 85 percent of base acres was implemented as part of the 1990 Farm Bill to reduce farm program costs. The 85 percent is still with us. Because the LDP is earned based on actual production, one can observe how the actual LDP or marketing loan gain changes at alternative cotton prices in Figure 2 and Table 1.

The national average DP yield is estimated at 600 lbs./acre and the CCP payment yield is estimated 640 lbs./acre. Given these payment yields, one can estimate that the DP is worth about 5.2 cents per pound on actual production. At the maximum CCP rate in 2003, the CCP program, on average, will add about 11.5 cents per pound of actual production. Adding the effective DP and CCP to the loan rate yields a net “price” of about 68.7 cents per pound of actual production if prices remain at or below the loan rate and producers fully capture their potential LDP’s. When market prices are higher than the loan rate, the CCP rate declines as indicated in Table 1, and farmers would receive about 83.69 percent of the difference between 65.73 and the market price.

### **Develop “Hedging” Strategies**

Producers, however, may add to government payments received by “hedging” LDP/MLG and CCP. Income gained from “hedging” strategies on futures price movements will add to program payments. This means producers who understand the cost-effective use of option strategies, including option spreads, can gain substantial financial rewards from potential price movements in futures, either up or down. Call options can be used to benefit from higher prices and put options to protect against lower prices. With the U.S. market heavily dependent on exporting more than half the annual crop, futures price changes due to market forces will likely exceed 20 cents per pound for each two-year contract period (Figure 3).

### **Counter-Cyclical Payment**

The new farm program indirectly leads to some interesting opportunities for producers to “protect” counter-cyclical payments. The program’s 72.4 cents per pound target price for cotton decreases to less than 69.0 cents after payment adjustments (remember, CCP’s are made on 85 percent of base acres), which is close to production costs for many producers. Also note that the CCP is only made on base acres and farm program yields that were established in past years and not made on production this year. Producers have several alternatives to update base acres and farm program yields for future years. Thus, producers that polish their skills in pricing strategies to gain several cents from the market in addition to program payments may get a step ahead in cash flow.

The maximum CCP of 13.73 cents will only be available to qualified producers in seasons when average monthly prices received by U.S. upland growers and weighted by monthly marketings for the August through July season are less than the CCC base loan rate of 52 cents per pound. The CCP will decline to zero when price received reaches 65.73 cents per pound (Table 1).

The average price received includes all qualities of cotton that are marketed. Therefore, the quality of cotton resulting from different weather patterns each season affects the price level received relative to the base grade used in futures contracts. The average quality may be above or below the base quality for futures contracts.

In addition, cotton quality, supply-demand balance and other market forces often influence futures and monthly prices received somewhat differently. Thus, past relationships show that the difference in the two prices is highly variable (Figure 4).

The relationship between prices received and futures, however, is more stable -- mostly in the range of minus 4 to 8 cents -- from August to December than from January to July when the monthly average price received fluctuates about minus 1 to 13 cents under futures each month (Table 2). Consequently, estimating the difference between futures price and farm price is a rough estimate at best.

The challenge in “hedging” the counter-cyclical payment lies in estimating the futures price level and movement for the marketing season well in advance of a sustained price rally. It may be desirable to purchase out-of-the-money call options earlier than in past years on December or March futures during the preceding fall and winter months when prices are usually seasonally weak. Since around half the crop is marketed during August through December, the practical approach to protecting the 52-cent trigger level for reducing the CCP is to first hedge using December and/or March calls. When hedging for the 2003/04 season, December 2003 futures could be used.

A strike price of 54 to 58 cents is a reasonable level to start purchasing calls, considering the potential variation in the relationship of farm price and futures (the minus 4 to 8 cents mentioned previously). When the futures price is below the desired strike price, relatively lower premiums for out-of-the-money call strike prices can be expected, and as futures price increases, so does the cost of “hedging” a full CCP.

Although a sustained futures price rally sufficient to reach an average price received of 52 cents is not likely during the 2002/2003 season, the outlook for higher prices during the 2003/04 season leave the possibility of a maximum CCP uncertain. There is little or no opportunity for CCP “hedging” if the futures price reaches toward 65 to 70 cents per pound or higher. Keep in mind also that the difference in price is for the average farm price received for all upland marketings versus the futures price. The price received by an individual producer is not considered when determining the CCP.

Once the price received is estimated in late fall for the first five months of the season, the need for further hedging using March, May, or July calls can be evaluated. The “hedge”, while somewhat inexact, will be most beneficial during seasons when future price rallies are in the mid-50 to mid 60-cent range. When the December 2003 price is above 50 cents, be watchful for estimates on 2003/04 acreage and crop production starting in the fall of 2002, and the resulting likelihood of a higher average price received than 52 cents.

### **Loan Deficiency Payments**

When market conditions worldwide suggest a potential futures price increase starting from some 5 to 20 cents per pound below the 52-cent CCC loan rate, out-of-the-money call options may offer some protection against a substantial decrease in LDP/MLG that may occur because of an increase in world price (“A” Index) before cotton is ready to market. On the other hand, producers who decide to accept LDP’s, yet hold cotton hoping for a higher price after foregoing the opportunity to place cotton under CCC loan, should seriously consider purchasing put options to protect against a sudden or unexpected price decrease that affects cotton intended to be sold later.

A world price for cotton is published by CotLook, LTD. United Kingdom as the CotLook “A” Index. The “A” Index is the average of the five lowest price quotes of the following world cotton descriptions (all 1-3/32"): Memphis Territory; California-Arizona; Mexico; Central America; Paraguayan; Turkish; Uzbekistan; Pakistani 1503; Indian H-4; Chinese Type 329; West African; Tanzanian; Greek; Syrian; and Australian.

From the “A” Index, also known as Northern European price, the adjusted world price (AWP) is calculated by USDA using a system that adjusts for average cost differences of transportation and handling, quality differences in U.S. (Strict Low Middling (SLM) 1-1/16" cotton) and world base quality (Middling (Mid)1-3/32") and average U.S. location for upland cotton. The AWP is announced for a weekly period from 5:00 p.m., Eastern Daylight Time, on Thursday through 3:59 p.m. the following Thursday. For example, on January 2, 2003 the Department of Agriculture’s CCC announced the prevailing world market price adjusted to U.S. at 43.31 cents per pound. The week’s AWP was determined as follows:

|                         |              |
|-------------------------|--------------|
| Northern European Price | 56.50        |
| Adjustments:            |              |
| Average U.S. Location   | -10.38       |
| SLM 1-1/16" Cotton      | -2.80        |
| Average U.S. Location   | <u>-0.01</u> |
| Sum of Adjustments      | -13.19       |
| AWP                     | 43.31        |

When the AWP is less than the CCC loan rate of 52 cents, the difference is made up by either a payment of LDP or by an MLG. From the example above, the LDP/MLG rate for the 2002 crop would be 8.69 cents per pound for the week as provided in the program provisions (52.00 - 43.31 cents).

Because the “A” Index is subject to worldwide market forces, the U.S. market price, based on a slightly different combination of market forces, may not move in direct relationship to the “A” Index (Figure 5).

However, the two prices usually move in the same direction over time. As a result, when the LDP/MLG is fairly large because of a low “A” Index and market forces indicate a potential price rise of several cents per pound before harvest, and the sale of cotton, producers may decide to “roughly hedge” the LDP/MLG by purchasing call options at strike prices below the 52-cent CCC loan rate. The lower the futures price relative to the loan rate, the more flexible the range of strike prices that are out-of-the-money, which gives a favorable leverage against option cost and possible gain.

### **Summary**

The cost of pricing strategies versus the risk protection and expected returns needs to be carefully evaluated and implemented when price levels are favorable for desired results. Remember that the market price and the LDP/MLG are driven up and down

by the amount of annual production against estimated use and expected carryover stocks in the U.S. and the rest of the world. Farm program benefits and income are influenced more by market direction and marketing decisions than under past programs. The CCP and DP are decoupled from current production and tied to historical acres and different yield base multiplied by 85 percent, as stated in the farm program.

Producers that decide to plant all or to plant none of their cotton program base acres to cotton, and expect to receive the maximum CCP, the decision to “hedge” the CCP against a potential average price received above 52 cents is a significant factor for maintaining cash flow from base acreage, and program payment yields. A strong cotton price rally could reduce or even eliminate the expected CCP. When the base acreage is not planted, there would be no cotton production and subsequent sales available to offset the payment reduction.

(This article is intended for educational purposes only.)

**References**

USDA. 2002. The Farm Security and Rural Investment Act of 2002.

Table 1. Example of Upland Cotton Prices and Payments Using a Range of U.S. Farm Price Received, “A” Index, Adjusted World Price, Marketing Loan Benefit, Counter-Cyclical Payment, Direct Payment, and Total of Government Payments.

| <b>U.S. Price Received</b> | <b>"A" Index</b> | <b>Adjusted World Price</b> | <b>Marketing Loan Benefit**</b> | <b>Counter-Cyclical Payment*</b> | <b>Direct Payment*</b> | <b>Total Government Payment</b> |
|----------------------------|------------------|-----------------------------|---------------------------------|----------------------------------|------------------------|---------------------------------|
| ----- Cents/Lb. -----      |                  |                             |                                 |                                  |                        |                                 |
| 35.00                      | 45.00            | 31.00                       | 21.00                           | 13.73                            | 6.67                   | 41.40                           |
| 40.00                      | 50.00            | 36.00                       | 16.00                           | 13.73                            | 6.67                   | 36.40                           |
| 45.00                      | 55.00            | 41.00                       | 11.00                           | 13.73                            | 6.67                   | 31.40                           |
| 50.00                      | 60.00            | 46.00                       | 6.00                            | 13.73                            | 6.67                   | 26.40                           |
| 52.00                      | 62.00            | 48.00                       | 4.00                            | 13.73                            | 6.67                   | 24.40                           |
| 55.00                      | 65.00            | 51.00                       | 1.00                            | 10.73                            | 6.67                   | 18.40                           |
| 56.00                      | 66.00            | 52.00                       | 0.00                            | 9.73                             | 6.67                   | 16.40                           |
| 60.00                      | 70.00            | 56.00                       | 0.00                            | 5.73                             | 6.67                   | 12.40                           |
| 65.00                      | 75.00            | 61.00                       | 0.00                            | 0.73                             | 6.67                   | 7.40                            |
| 65.73                      | 75.73            | 61.73                       | 0.00                            | 0.00                             | 6.67                   | 6.67                            |
| 70.00                      | 80.00            | 66.00                       | 0.00                            | 0.00                             | 6.67                   | 6.67                            |

\*Direct Payments and Counter-Cyclical Payments not on full production.

\*\*Marketing Loan Benefit represents either loan deficiency payment or marketing loan gain.

For illustrative purposes in this educational example, the U.S. average price received is a constant \$0.10 per pound less than the “A” Index. Under actual market conditions, the difference in U.S. average price received and the “A” Index (Northern European Price) varies substantially. The adjusted world price examples are a constant \$0.14 under “A” Index. This difference also varies slightly as market forces change.

Table 2. Five Year Average U.S. Price Received vs. Futures Differences and % Cumulative Marketings, 1997 - 2002 Crops.

| Month     | Range in Monthly Difference | Average Difference (cents/lb.) | Average Cumulative % of Marketings |
|-----------|-----------------------------|--------------------------------|------------------------------------|
| August    | -10.84 to 0.96              | -5.51                          | 4.01                               |
| September | -12.82 to 2.77              | -5.16                          | 8.53                               |
| October   | -7.83 to 3.57               | -3.25                          | 18.66                              |
| November  | -6.65 to -0.93              | -4.18                          | 35.19                              |
| December  | -7.13 to -0.59              | -4.41                          | 52.56                              |
| January   | -11.97 to -1.18             | -6.94                          | 67.30                              |
| February  | -9.98 to -3.19              | -6.78                          | 76.05                              |
| March     | -12.76 to -4.65             | -8.47                          | 83.35                              |
| April     | -11.07 to 0.27              | -4.84                          | 87.76                              |
| May       | -13.25 to -2.69             | -5.75                          | 91.86                              |
| June      | -11.00 to -0.37             | -5.09                          | 96.39                              |
| July      | -8.95 to 3.78               | -4.76                          | 100.00                             |

Source: USDA "Agriculture Prices" and "Cotton Price Statistics", monthly.

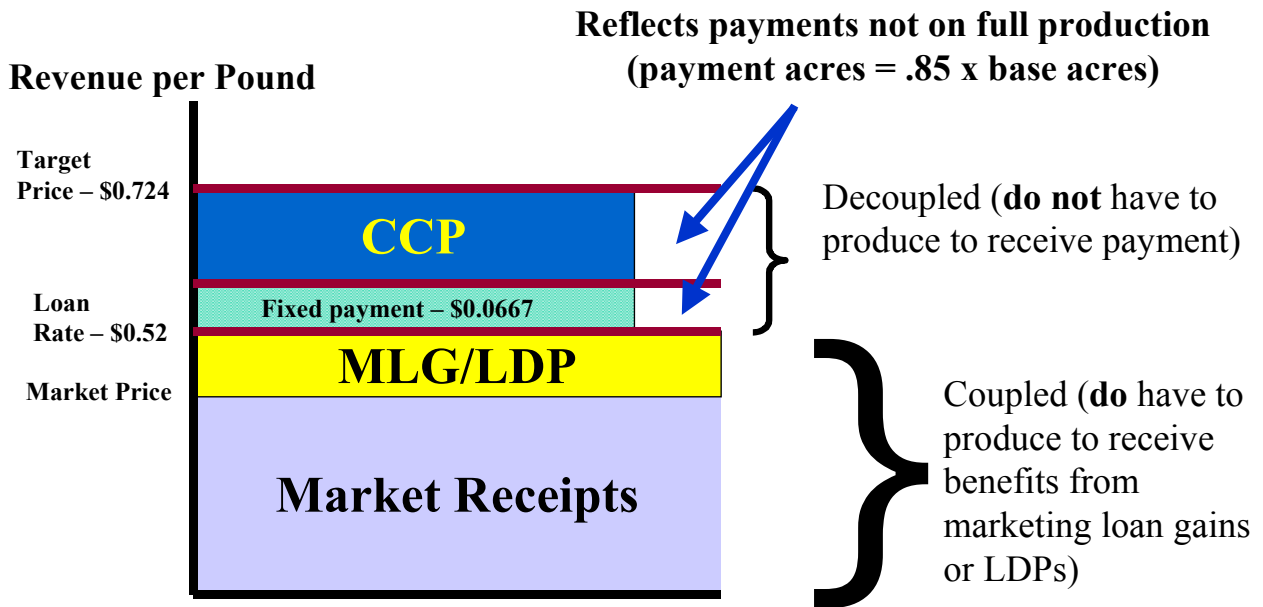
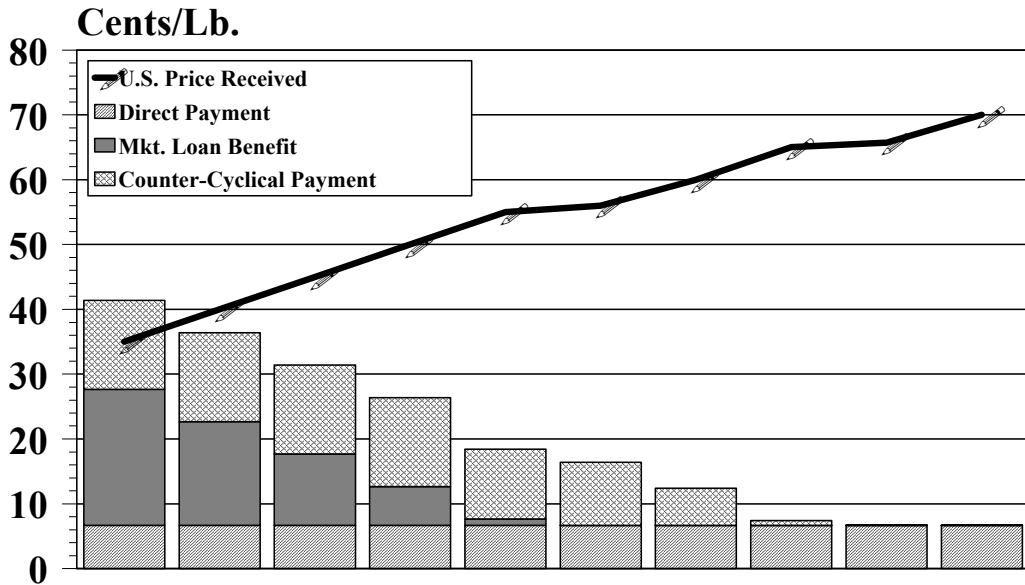


Figure 1. Distribution of program payments for upland cotton.



Reflects maximum payments (actual DP and CCP payments not on full production, payment acres = .85 x DP or CCP payment yields). Decoupled - Do not have to produce to receive payment. Loan Rate = 52.0 cents; Target Price = 72.4 cents

Figure 2. Upland cotton program benefits drop steeply as price received increases toward loan rate and target price.

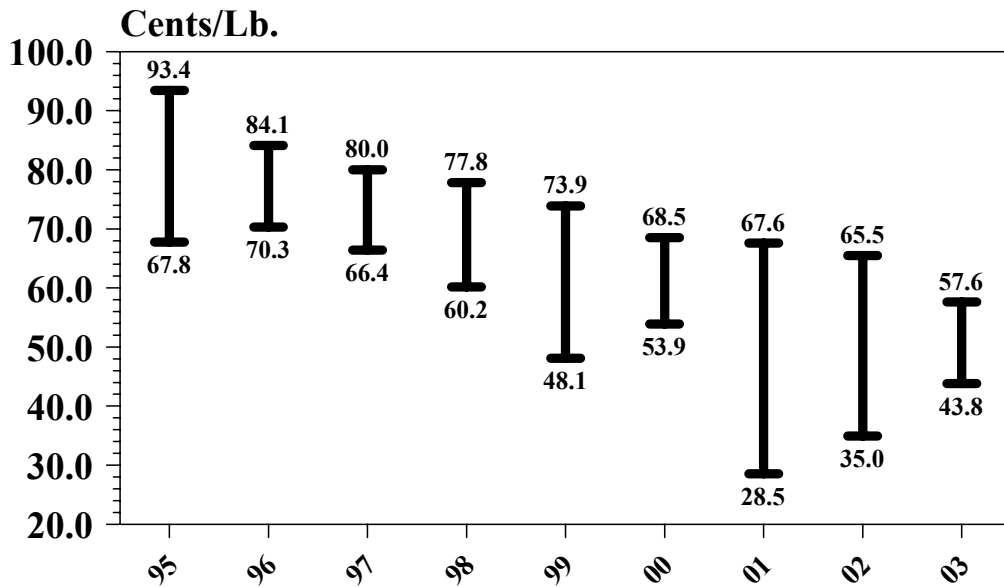


Figure 3. New York cotton futures high and low settlement prices, December contracts, 1995-2003 crop years.

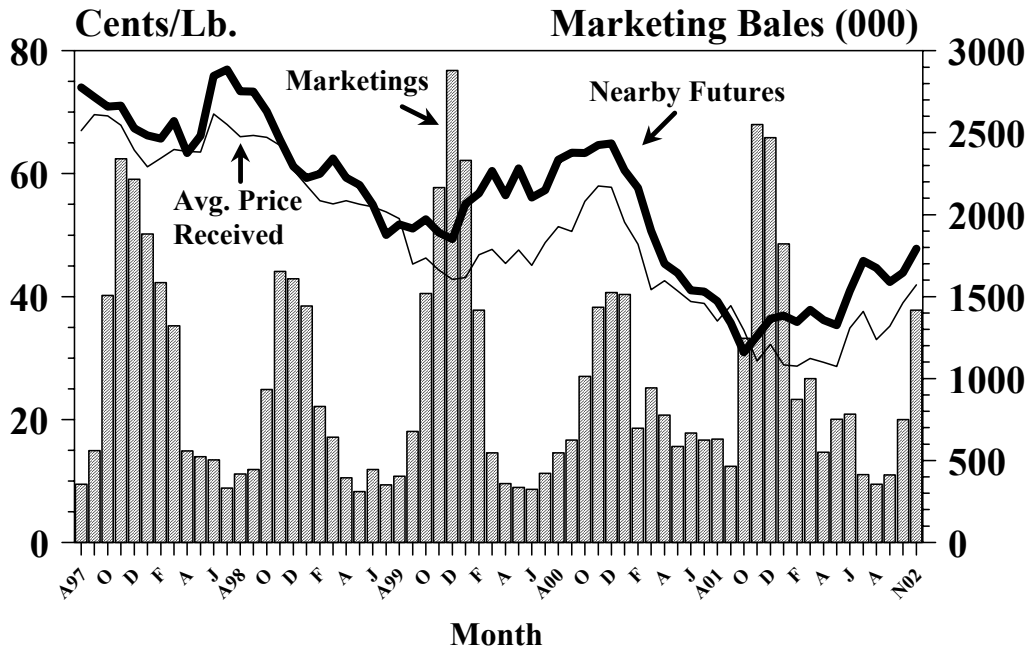


Figure 4. Upland cotton: monthly nearby futures, average price received, and marketings, 1997-2002 crop years.

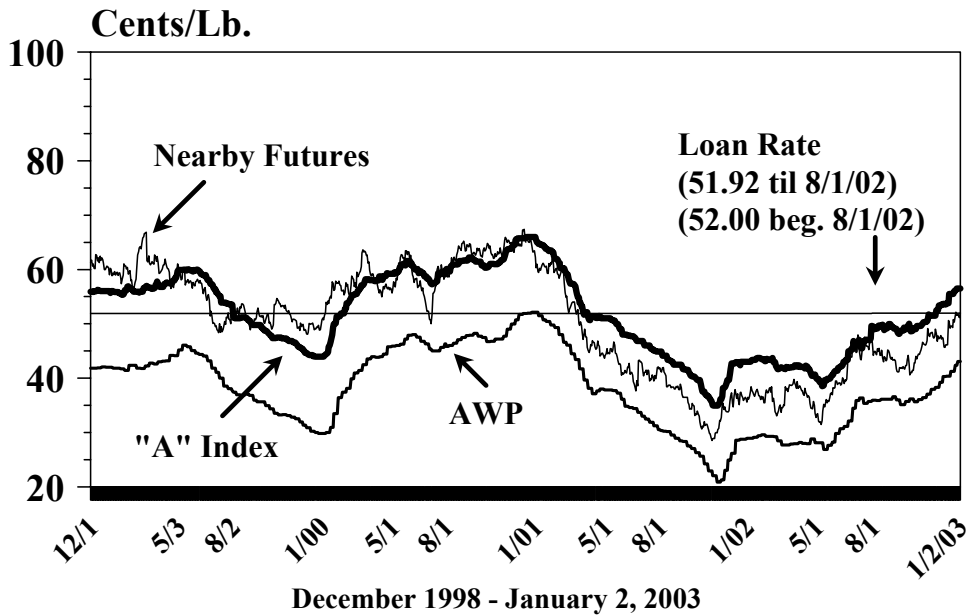


Figure 5. World cotton prices: "A" Index, nearby futures, AWP, and U.S. loan rate.