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The New Era of Corn, Soybean, and Wheat Prices

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"Prices have changed so much for what we sell and buy that it is almost impossible to feel confident in the decisions you make."

-- Agriculture Online, July 5, 2008

Prices of corn, soybeans, and wheat started moving higher in the fall of 2006 and have remained generally high and well above average prices in the previous 30 years. These higher prices, and the volatility associated with the higher prices, have resulted in the kind of uncertainty reflected in the quote above. Are higher prices here to stay? If so, what is the expected level and variability of prices during the new era? From a producer's standpoint, the question really is, "What is a good price for corn, soybeans and wheat?" These questions cannot be answered with certainty, but unfolding evidence suggests that prices are indeed likely establishing a higher average than that experienced in recent history. The factors supporting this conclusion include generally tight world inventories, growing world demand for food and biofuels, and escalating costs of production (e.g., Trostle 2008).

In this brief, we examine some aspects of price behavior for corn, soybeans, and wheat during the pre- and post-January 1973 period and combine that experience with current market fundaments to generate expectations about price behavior in the current era.

Insight regarding the probable magnitude and variance of prices in this new era can be provided by the previous shift in nominal price levels that occurred starting in 1973. The first period examined is January 1947 through December 1972 and the second is the period from January 1973 through November 2006. These periods were selected because each is thought to represent a structural shift in market conditions from the previous period, resulting in a higher level of nominal prices. The first period starts immediately after World War II when price controls were lifted and the post-war rebuilding effort began. The second period begins with the changes brought about by shifts in exchange rate policies, grain purchases by the former Soviet Union, and a period of escalating energy prices and more rapid inflation.

Figures 1 though 3 depict the average monthly farm price of corn, soybeans, and wheat, respectively, in Illinois from January 1947 through July 2008. These charts clearly illustrate the change in the nominal price levels that occurred in the early 1970's and the extreme volatility in prices during the early years of both periods. The charts also present the average price for each

commodity in the post-World War II and post-1972 eras. Note that the post-1972 era is assumed to end in November 2006. For all three commodities, nominal price levels appear to have jumped to a new level, rather than a temporary spike, late in 2006.

As shown in Table 1, the average monthly price of corn increased by 89 percent from the post- World War II period to the post-1972 period. The average price of wheat increased by a similar amount, 79 percent. The largest increase, 134 percent, was for soybeans as that crop transitioned from a minor to a major crop in the U.S. As a starting point, if average monthly prices in the new era that appears to have begun in late 2006 increase by a similar amount over the post-1972 period, averages would project to about $4.60 for corn, $5.80 for wheat, and $14.40 for soybeans.

The relationship between projected corn and wheat prices appears reasonable, reflecting a wheat/corn price ratio of 1.26. That is a little lower than in either of the two previous periods, but consistent with the trend towards a lower ratio. The projected average monthly price of soybeans is likely too high relative to the other two crops as it reflects a soybean/corn price ratio of 3.13. That ratio is well above historic relationships and above the ratio that makes the two crops competitive from a production standpoint. A ratio of 2.5, close to the historical average since 1973, would result in an average soybean price projection of $11.50.

In addition to the average monthly price, history may provide some insight into the likely ranges in monthly prices during the first few years of the current price era. As indicated in Table 1, the lowest monthly price of corn in the first 5 years of the previous two price eras ranged from 66 to 77 percent of the average of the monthly prices over the entire period. The highest monthly price in the first 5 years ranged from 146 to 201 percent of the average. For soybeans, the lowest monthly price during the first 5 years ranged from 71 to 81 percent of the average of the monthly prices for the entire period, and the high ranged from 161 to 166 percent of the average. For wheat, the lowest monthly price ranged from 57 to 96 percent of the average of the entire period, and the highest monthly price ranged from 162 to 175 percent of the average.

The average of the percentage price ranges during the first 5 years of the previous two periods and an average price of $4.60 for corn, $11.50 for soybeans, and $5.80 for wheat projects to ranges in average monthly prices over the first few years of the current era of $3.30 to $8.00 for corn, $8.75 to $18.80 for soybeans, and $4.45 to $9.75 for wheat. Using the percentage price ranges only during the first 5 years of the most recent period results in projected monthly price ranges for the current period of $3.00 to $6.70 for corn, $8.20 to $19.00 for soybeans, and $3.30 to $10.15 for wheat. The primary differences between using the most recent period rather than the average of the two are the projection of the high price of corn and the low price of wheat. We believe that projections based only on the most recent period are more representative of the likely range of prices in the future. To aid the reader, average prices and ranges projected for the future are presented both in Table 2 and Figures 4-6.

In the period from December 2006 through July 2008, the average monthly price of corn in Illinois was $3.93, in a range of $3.00 to $5.71. The average monthly price of soybeans was $9.40, in a range of $6.21 to $14.10. The average monthly price of wheat was $6.09, in a range of $3.97 to $10.40. To date, then, the average monthly price of corn and soybeans has been lower than projected for the new era, but with prices since early 2008 above the projected average. The average price of wheat has been slightly higher than the projected average for the period.

The lowest average monthly price of soybeans since December 2006 is lower than the lowest price projected from performance in the first 5 years of the previous period. The lows were in December 2006 and January 2007, perhaps indicating the designation of the new price era should be a few months later than December 2006. The highest average monthly price of wheat projected by past performance ($10.15) was exceeded in March 2008 ($10.40). Prices have declined sharply since then. Average monthly corn prices since December 2006 have been within the projected range.

Are the price level expectations for the current era consistent with known fundamentals? The question really centers on corn prices. While the methods employed here are quite simple, the average price level projected for corn ($4.60) is consistent with other price projections that use sophisticated econometric models (e.g., Babcock 2008). Compared to the futures market, which is currently projecting prices close to $6 through 2011, our projection of the average corn price is relatively conservative.

Current market fundamentals center on large amounts of corn used for ethanol production, suggesting that corn prices will continue to be closely tied to energy prices in the immediate future and that the price of the other two crops will have to be competitive with the price of corn. At the margin, the simplest way to think about corn prices is the value of corn to the ethanol producer. To a large extent, the value of corn is a function of the price of ethanol, which is a function of the structure of subsidies and the price of gasoline. In turn the price of gasoline is a function of the price of crude oil. As a result, a key variable in determining the level of corn prices in the future is the price of crude oil.

There are several important "take-home" points for producer's struggling with the question, "What is a good price for corn, soybeans and wheat?" First, it is likely that a permanent shift has occurred in the level of corn, soybean, and wheat prices. The main point of debate is the size of the shift. Second, peak prices since December 2006 for all three commodities were well above average prices projected for the new era. This does not mean even higher prices cannot occur in the near future, but it does provide useful perspective on just how high prices did move. Third, prices can still move to "low" levels in this new era, particularly in relation to production costs, and they can stay there for considerable periods of time. For example, corn prices could easily return to the low $3 range for a period time, soybean prices to the low $8 range, and wheat prices to the mid $3 range.

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Trostle, R. "Global Agricultural Supply and Demand: Factors Contributing to the Recent Increase in Food Commodity Prices." Outlook Report No. WRS-0801, Economic Research Service, U.S. Department of Agriculture, May 2008. [http://www.ers.usda.gov/Publications/WRS0801/WRS0801.pdf]

Table 1. Summary of Monthly Average Corn, Soybean, and Wheat Prices in Illinois (January 1947-December 1972 and January 1973 – November 2006)

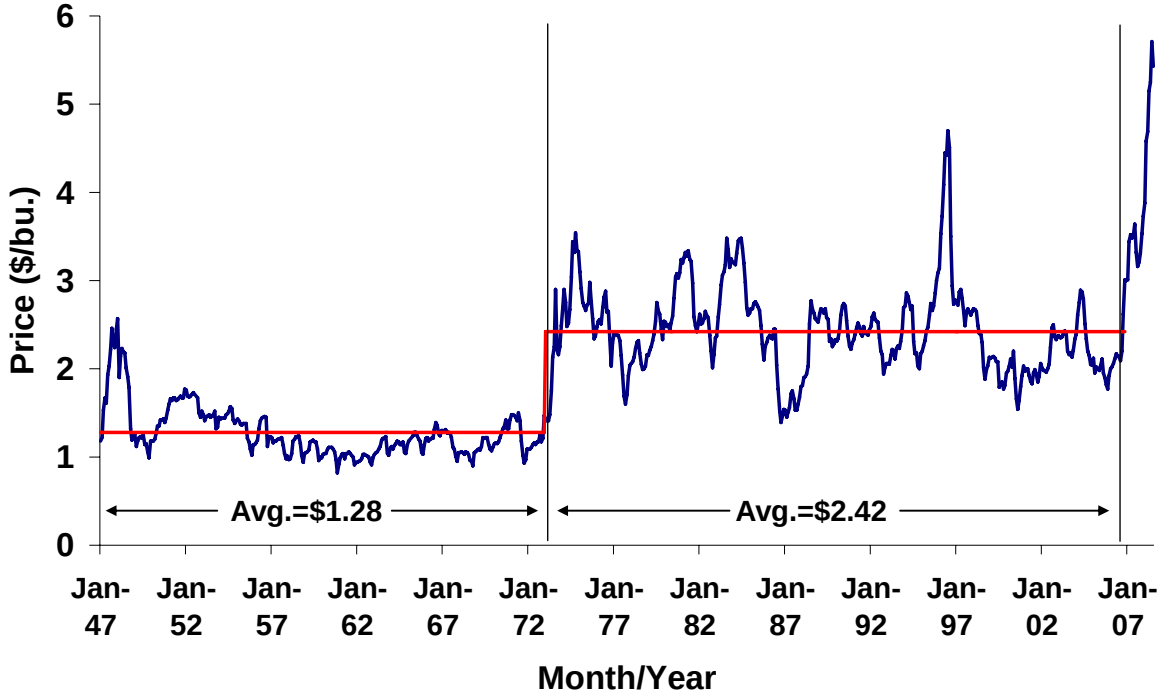
	Jan. 1947-Dec. 1972		Jan. 1973-Nov. 2006		% Increase
CORN		$ per bushel			
Average Monthly Price	1.28		2.42		89
Highest Monthly Price in First 5 Years	2.57	(2.01)	3.54	(1.46)	NA
Lowest Monthly Price in First 5 Years	0.99	(0.77)	1.60	(0.66)	NA
SOYBEANS					
Average Monthly Price	2.63		6.15		134
Highest Monthly Price in First 5 Years	4.24	(1.61)	10.20	(1.66)	NA
Lowest Monthly Price in First 5 Years	2.14	(0.81)	4.35	(0.71)	NA
WHEAT					
Average Monthly Price	1.81		3.24		79
Highest Monthly Price in First 5 Years	2.94	(1.62)	5.66	(1.75)	NA
Lowest Monthly Price in First 5 Years	1.74	(0.96)	1.84	(0.57)	NA
Wheat/Corn Price Ratio	1.41		1.34		
Soybean/Corn Ratio	2.05		2.54		

Note: Number in parentheses is the ratio of the high or low price in the first 5 years of the period to the average price for the entire period. NA denotes 'not applicable.'

Table 2. Projected Average Monthly Corn, Soybean, and Wheat Prices in Illinois, Post-December 2006

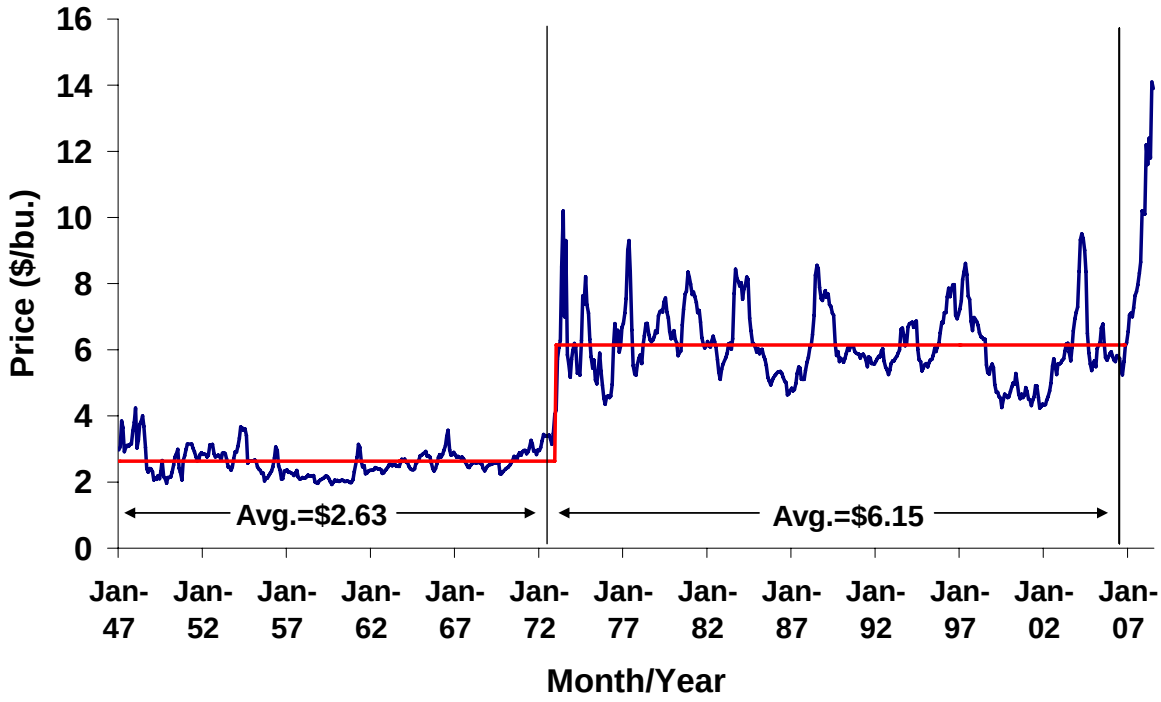
	Corn	Soybeans	Wheat
		$ per bushel	
Average Monthly Price	4.60	11.50	5.80
Highest Monthly Price	6.70	19.10	10.15
Lowest Monthly Price	3.00	8.20	3.30

Figure 1. Monthly Farm Price of Corn in Illinois, January 1947- July 2008



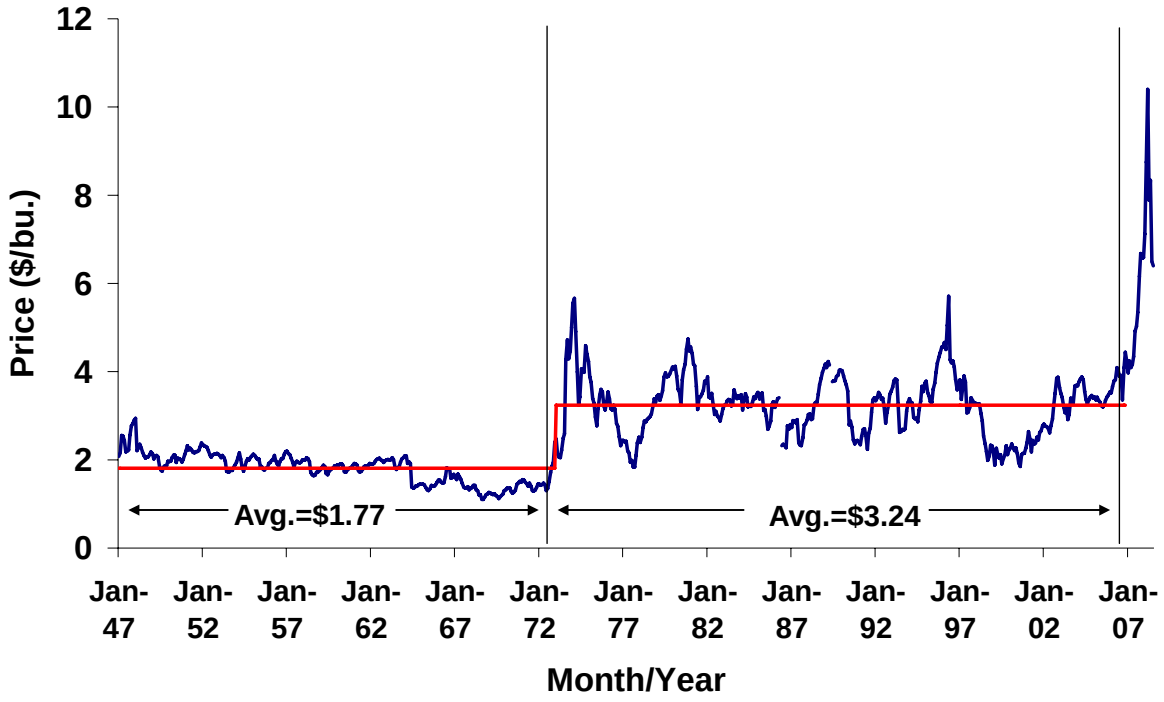
Source: USDA

Figure 2. Monthly Farm Price of Soybeans in Illinois, January 1947- July 2008



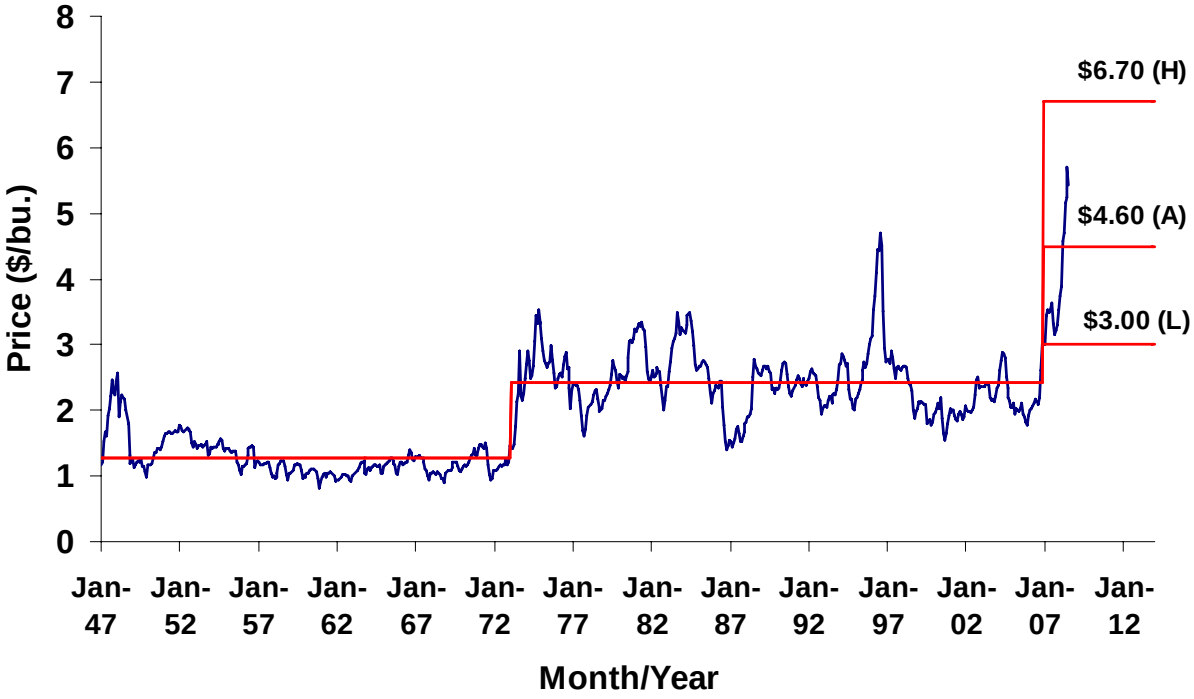
Source: USDA

Figure 3. Monthly Farm Price of Wheat in Illinois, January 1947- July 2008



Source: USDA

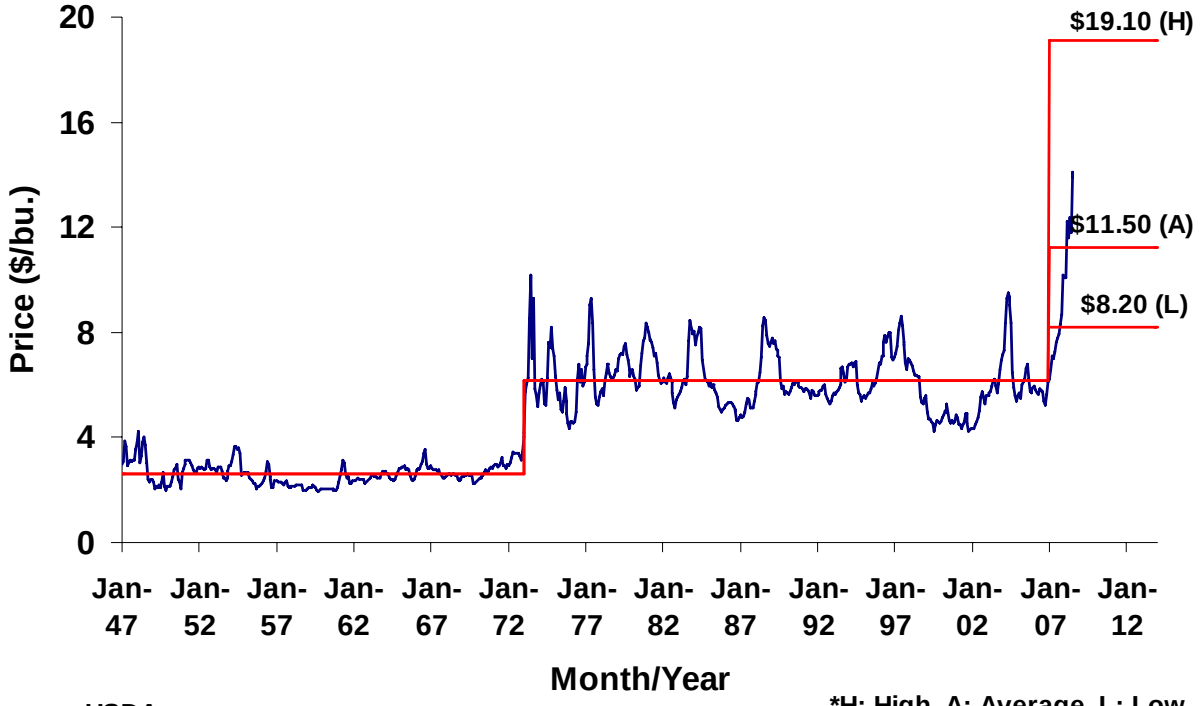
Figure 4. Monthly Farm Price of Corn in Illinois, January 1947- July 2008 and Projected Future Range*



Source: USDA

*H: High, A: Average, L: Low

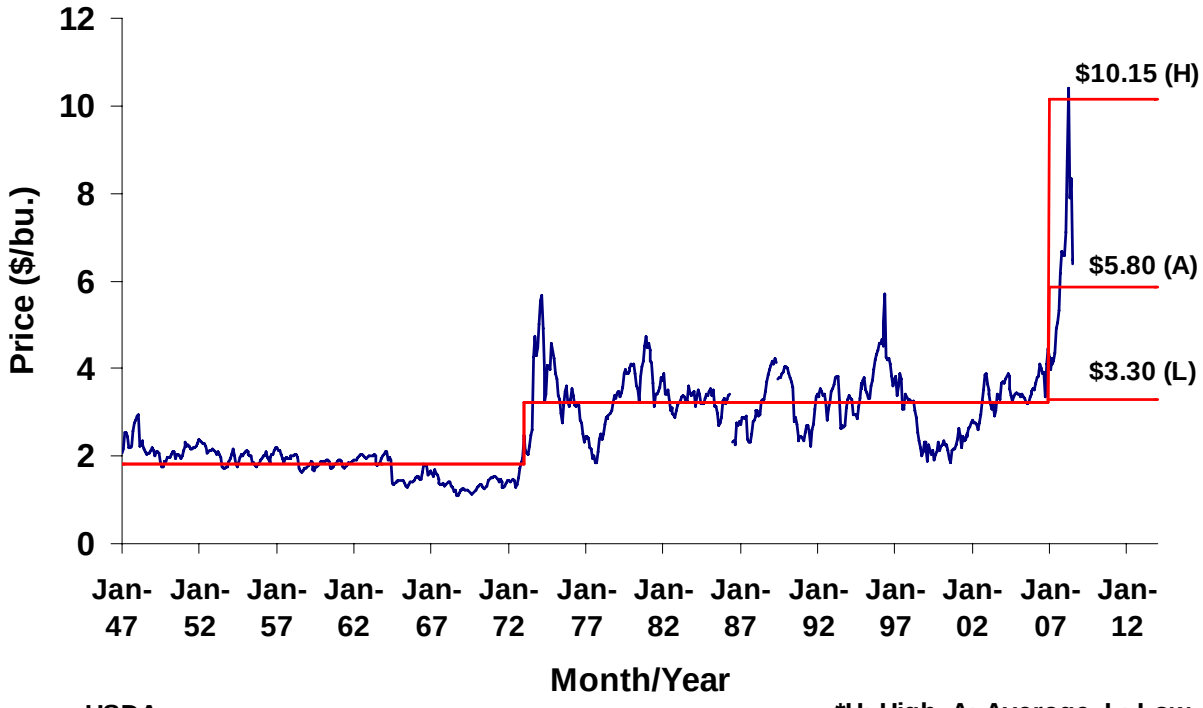
Figure 5. Monthly Farm Price of Soybeans in Illinois, January 1947- July 2008 and Projected Future Range*



Source: USDA

*H: High, A: Average, L: Low

Figure 6. Monthly Farm Price of Wheat in Illinois, January 1947- July 2008 and Projected Future Range*



Source: USDA

*H: High, A: Average, L: Low