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Staff Paper

**Soybean Outlook Presented for the
Organized Symposium of the Extension Crops Outlook
at the 2005 AAEA Meetings, July 25, 2005**

James Hilker

Staff Paper 2005-09

July, 2005



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**By
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Soybean Outlook

“Given” all my numbers are “correct,” we should expect 2005-06 soybean prices to be in the same range as the previous couple of years. I generally try and tell my stories using Supply/Demand Balance Sheets. Tables 1-3 are attached. In Table 1, Soybean Supply/Demand Balance Sheet, for 2005-06, I show the July 12 USDA projection, my (Hilker) July 25 projections, and my best guess at the market’s projections. On the other hand, while the numbers shown are USDA’s, Hilker’s, and the market’s best analysis, I feel there is a lot of price risk in both directions as we go from now through the 2005-06 marketing year, see Figure 1, the Price Probability Distribution. I keep my outlook information undated and available bimonthly on my website at <http://www.msu.edu/user/hilker/>. I also post future price probability distribution forecasts, based on the options markets weekly and generally based on Wednesday’s closes, on the same website.

The June Acreage Report showed that 73.3 million acres of soybeans were planted this year, 1.9 million acres less than last year. The March Intentions Report had indicated acreage would be down 1.3 million acres, but the early corn planting season and rust scares changed that. Acreage harvested is expected to be 900,000 less acres than planted, after last year’s 1.2 million acres of abandonment. But if some areas don’t get some rain soon that number will creep back up.

They say soybeans are made in August, given that, it appears the USDA used the trend yield of 39.9 bu/ac for this analysis. However, the soybean crop conditions report as of July 18 only showed 53% of the crop in good to excellent conditions, this compares with 68% last year when we had record yields and the 5-year average in the 60% range. This would indicate a below average yield, I have used 39 bu/ac, 3% off a trend yield of 40.2 bu/ac. A DTN analysis suggested 38.7 bu/ac based on the July 18 report. Working backwards from the Nov-Mar 2005-06 futures prices of \$6.80, I suggest the trade is calling for a yield of 38 bu/ac. When expected acres harvested are multiplied by the above yields you have the three 2005 production Figures shown on Table 1. All much smaller than last year, and all much bigger than two years ago, the projections had a spread of 139 million bushels. While Figure 1 is a price probability distribution, the biggest factor in its shape is the expected U.S. and world yield probability distributions.

While moisture and temperature are the primary yield risks, there are several others. Soybean aphids are above threshold in a few areas already, and it appears many of the north-central States will have to do some spraying. White Mold is another, but it takes cool and wet, which at this point we see little of, but that could change in August. A soybean cyst nematode is the single largest yield robbing pest year in and year out. Sudden death syndrome is another. And then there is the risk of Asian Rust, which is already a factor in parts of the deep south. There recently was a very interesting DTN five part series on the China Rust Lessons (Copyright 2005, Daniel Davidson, DTN Agronomist). Are we more like China or Brazil or some combination? The article points out that China pays very little attention to it, even though that is where it is from. The Chinese point out three main factors, wind, heat, and sequence of planting across the country, i.e., spore availability. Like China, only our south has heat, Brazil is all heat, so spores survive all year long. China has weak south winds. Ours are stronger. All three growing areas of China plant at different times, this means less spore availability, the U.S. is pretty much all at once.

Domestic crush in the 2004-05 marketing year is expected to be up 10.5% compared to 2003-04, as both domestic use and exports of oil and meal increased sharply. This would be expected given our poor 2003-04 crop and our record 2004-05 crop, especially given the past two South American crops

relative to ours. Crush in 2005-06 is expected to be in the same range as 2004-05, except more will be used domestically and less exported. The USDA-WASDE Soybean and Soybean Meal Supply/Demand projections are shown in Tables 2. Due to lower production estimates, myself and the trade are projecting slightly lower figures, as shown on Table 1.

With eight weeks left, export shipments were 1034 million bushels versus the 1110 USDA 2004-05 projection. Weekly shipments have been running 3-6 million bushels a week. Export sales through July 14 were 1108 million bushels. Last year exports ran 885 million bushels. Therefore, it looks like we will be close to the USDA projection for 2004-05. So what will exports be in 2005-06? The USDA projects they will be 1135 million bushels, and that seems reasonable given their supply projection. As shown in Table 1, the trade and my 2005-06 U.S. export projections are down due to the lower production estimates and thus higher prices. I use the USDA World Supply/Demand projections for this analysis, they are shown in Tables 3-5. I also assume the USDA's other oilseeds projections.

While South America is expected to return to trend yields, there is not expected to be a huge increase in planted area. In Brazil, high costs, poor yields, and the Asian rust, all related of course, have taken some steam out of their sails. However, as you can see in Table 3, 2005-06 world ending stocks are expected to be a record. But in the short run the U.S. projections set the price, if the last two years hold true.

U.S. ending stocks for 2005-06 are projected to be 210, 203, and 161 million bushels, 7.1, 7.0, and 5.6 percent of use, as shown in Table 1, given the three projections. The USDA is projecting the annual average weighted price to be \$5.60, Hilker \$6.00, and the trade, \$6.50. The trade, of course is close to new crop bids at this time, that is how I build the Market projection. How do we get from these stocks-to-ending stocks as a percent of use to the price?

I use Graph 1, which is a plot of prices versus ending stocks/use. If we look at 1981 through about 1998 there appears to be a pattern as prices go up and down which was gradually shifting to the left, then BOOM. Lower ending stocks as a percent of use and lower prices from 1999-00 to 2002-03, not good! Something changed big time. But 2003-04 and 2004-05 seems to have come back, but how much, especially with lower prices. The corn chart is fairly clear, but it is hard to draw a curve to represent the information in Graph one. But I did it anyhow, in fact I did it twice (Hilker Voo Doo econometrics). The left-hand curve seems to fit the USDA price projection for 2005-06. The right-hand curve represents the market and Hilker's price projections. The last three Dots on graph 1 are the three different price projections. The last dot is the market, hidden under \$6.50. The next to last dot is Hilker, on the curve on the right on \$6.00. And the third to last, is the USDA, at \$5.60. You can see how much to two different curves mean with respect to price. Both the USDA and Hilker are near 7% stocks-to-use, and we are \$0.40 apart in Price. Below Graph 1 is some sensitivity analysis, it is an average for the two curves, I should have done them separate.

A 5.6 % of use ending stocks would have given us \$7 prices just 5-6 years ago, than it didn't, now it will. What's happened? I called the 1999-2002 period "Just in Time Inventory" phenomenon. Nobody is worried, by the time we know the U.S. crop size South America can still adjust, and vice a vera. How likely is it that each of us won't have enough to get to the other ones harvest? It can happen, two bad crops, but unlikely. But it did happen to some degree in 2003, so now we seem to worry about the U.S. and then later about South America, at least in a relative sense. It is time to start looking at both world ending stocks and the interaction cause by crops coming in two times a year. I realize that economics would suggest we always should have been looking at world stocks/use, but as long as we were the residual suppliers the U.S. number worked and seems to be working again.

TABLE 1
SUPPLY/DEMAND BALANCE SHEET FOR SOYBEANS

		Estimated	USDA Projected	Hilker Projected	Market Projected
	2003 - 04	2004 - 05	2005 - 06	2005 - 06	2005 - 06
<hr/>					
(Million Acres)					
Acres Planted	73.4	75.2	73.3	73.3	73.3
Acres Harvested	72.3	74	72.4	72.4	72.4
Bu./Harvested Acre	33.9	42.5	39.9	39	38
<hr/>					
(Million Bushels)					
Beginning Stocks	178	112	290	290	290
Production	2454	3141	2890	2825	2753
Imports	6	5	3	3	3
Total Supply	2638	3258	3183	3118	3045
<hr/>					
Use:					
Crushings	1530	1690	1690	1680	1675
Exports	885	1110	1135	1085	1060
Seed and Residual	111	169	148	148	148
Total Use	2526	2969	2973	2913	2883
<hr/>					
Ending Stocks	112	290	210	205	162
Ending Stocks, %of Use	4.4	9.8	7.1	7.0	5.6
<hr/>					
U.S. Loan Rate	\$5.00	\$5.00	\$5.00	\$5.00	\$5.00
<hr/>					
U.S. Season Average					
Farm Price, \$/Bu.	\$7.34	\$5.80	\$5.60	\$6.00	\$6.50
<hr/>					
Source: USDA and Jim Hilker. (7- 25 - 05)			7/12/2005		

Table 2

USDA-WASDE U.S. Soybeans Products Supply and Use (Domestic Measure) 1/				
=====				
Item	:	:	:	2005/06 Projections
	:	2003/04	2004/05	=====
	:	:	Est.	June July
=====				
	:			
	:			
	:			
	:			
SOYBEAN OIL:	:			
	:			
Beginning stocks	:	1,491	1,076	1,526 1,696
Production	:	17,080	19,215	18,950 19,065
Imports	:	306	105	110 110
Supply, total	:	18,877	20,396	20,586 20,871
Domestic	:	16,866	17,300	17,650 17,650
Exports	:	935	1,400	1,400 1,550
Use, total	:	17,801	18,700	19,050 19,200
Ending stocks	:	1,076	1,696	1,536 1,671
Average price (c/lb) 2/	:	29.97	23.25	20.50- 21.00-
	:			23.50 24.00
	:			
	:			
	:			
	:			
SOYBEAN MEAL:	:			
	:			
Beginning stocks	:	220	211	250 250
Production	:	36,324	40,274	40,035 40,235
Imports	:	270	165	165 165
Supply, total	:	36,815	40,650	40,450 40,650
Domestic	:	31,515	33,200	34,400 33,650
Exports	:	5,089	7,200	5,800 6,750
Use, total	:	36,604	40,400	40,200 40,400
Ending stocks	:	211	250	250 250
Average price (\$/s.t.) 2/	:	256.05	185.00	160.00- 165.00-
	:			190.00 195.00

=====

Note: Reliability calculations at end of report. 1/ Marketing year beginning September 1 for soybeans; October 1 for soybean oil and meal. 2/ Prices: Soybeans, marketing year weighted average price received by farmers; for Oil, simple average of crude soybean oil, Decatur; for Meal, simple average of 48 percent, Decatur. 3/ Supply estimates and reported use through May, coupled with USDA's June 1 stocks estimate, indicate an above-average residual. *Planted acres reported in March 31 Prospective Plantings. Harvested acres based on 5-year average planted-to-harvested ratios by state. Projected yield based on 1978-2004 regional trend analysis. **Planted and harvested acres from the June 30 Acreage report. Projected yield based on 1978-2004 regional trend.

Table 3

USDA-WASDE World Soybean Supply and Use 1/
(Million Metric Tons)

=====								
	:	Supply			:	Use		:
Region	:	=====			:	=====		:
	:	:	:	:	:	:	:	Ending
	:	Beginning	Produc-	:	:	Domestic	:	stocks
	:	stocks	tion	Imports	Crush	Total	Exports	:
=====								
	:							
	:	2003/04						
World 2/	:	40.40	186.26	54.03	163.65	190.02	55.67	35.00
United States	:	4.85	66.78	0.15	41.63	44.78	23.95	3.06
Total foreign	:	35.54	119.48	53.88	122.02	145.24	31.72	31.94
Major exporters 3/	:	28.49	87.41	0.88	55.36	60.00	29.30	27.47
Argentina	:	12.47	33.00	0.54	25.04	26.62	6.71	12.68
Brazil	:	15.93	50.50	0.33	29.33	32.24	19.82	14.70
Major importers 4/	:	6.05	17.43	43.57	49.00	63.24	0.34	3.46
China	:	4.47	15.39	16.93	25.44	34.38	0.32	2.10
EU-25	:	0.93	0.63	14.64	14.13	15.46	0.01	0.74
Japan	:	0.31	0.23	4.69	3.54	4.93	0.00	0.30
Mexico	:	0.05	0.13	3.80	3.89	3.93	0.00	0.04
	:							
	:	2004/05 (Estimated)						
World 2/	:	35.00	214.32	61.46	173.59	203.26	62.43	45.08
United States	:	3.06	85.48	0.14	45.99	50.58	30.21	7.89
Total foreign	:	31.94	128.84	61.32	127.60	152.68	32.22	37.19
Major exporters 3/	:	27.47	93.80	1.15	56.42	61.59	29.80	31.02
Argentina	:	12.68	39.00	0.60	25.53	27.28	8.17	16.84
Brazil	:	14.70	51.00	0.53	29.39	32.60	19.54	14.09
Major importers 4/	:	3.46	20.15	49.99	52.81	68.11	0.38	5.11
China	:	2.10	18.00	23.20	29.40	39.25	0.35	3.70
EU-25	:	0.74	0.79	14.96	14.29	15.69	0.01	0.79
Japan	:	0.30	0.17	4.40	3.20	4.58	0.00	0.28
Mexico	:	0.04	0.13	3.80	3.89	3.93	0.00	0.04
	:							
	:	2005/06 (Projected)						
World 2/	:							
July	:	45.08	219.71	65.68	182.44	213.11	66.62	50.73
United States	:							
July	:	7.89	78.65	0.08	45.99	50.03	30.89	5.71
Total foreign	:							
July	:	37.19	141.05	65.60	136.45	163.09	35.73	45.02
Major exporters 3/	:							
July	:	31.02	105.80	1.03	59.83	65.55	33.40	38.90
Argentina	Jul	16.84	39.00	0.50	26.63	28.58	8.40	19.35
Brazil	Jul	14.09	62.00	0.52	31.60	35.15	22.00	19.46
Major importers 4/	:							
July	:	5.11	19.29	54.20	56.87	72.98	0.37	5.25
China	Jul	3.70	17.00	27.00	33.12	43.67	0.33	3.70
EU-25	Jul	0.79	0.85	15.20	14.50	15.94	0.01	0.89
Japan	Jul	0.28	0.23	4.50	3.30	4.69	0.00	0.32
Mexico	Jul	0.04	0.13	4.00	4.09	4.13	0.00	0.04

1/ Data based on local marketing years except Argentina and Brazil which are adjusted to an October-September year. 2/ World imports and exports may not balance due to differences in local marketing years and to time lags between reported exports and imports. Therefore, world supply may not equal world use. 3/ Argentina, Brazil and Paraguay. 4/ Japan, China, and EU, Mexico, and Southeast Asia (includes Indonesia, Malaysia, Philippines, and Thailand).

Table 4

USDA-WASDE World Soybean Meal Supply and Use 1/
(Million Metric Tons)

=====							
Region	:	Supply			:	Use	
	:	=====			:	=====	
	:	:	:	:	:	:	Ending
	:	Beginning	Production	Imports	Total	Domestic	Exports
=====							
2003/04							
World 2/	:	4.44	128.78	44.70	128.91	45.31	3.69
United States	:	0.20	32.95	0.25	28.59	4.62	0.19
Total foreign	:	4.24	95.82	44.45	100.32	40.69	3.50
Major exporters 3/	:	1.16	46.96	0.27	10.02	37.02	1.35
Argentina	:	0.35	19.76	0.00	0.62	18.95	0.54
Brazil	:	0.77	22.78	0.27	8.28	14.76	0.78
India	:	0.05	4.42	0.00	1.12	3.31	0.04
Major importers 4/	:	1.19	33.04	26.77	58.77	1.11	1.13
EU-25	:	0.87	11.10	21.86	32.59	0.40	0.85
China	:	0.00	20.19	0.02	19.54	0.67	0.00
2004/05 (Estimated)							
World 2/	:	3.69	136.63	45.34	135.86	46.18	3.62
United States	:	0.19	36.54	0.15	30.12	6.53	0.23
Total foreign	:	3.50	100.09	45.19	105.74	39.65	3.39
Major exporters 3/	:	1.35	46.77	0.20	11.31	35.81	1.21
Argentina	:	0.54	20.16	0.00	0.76	19.27	0.68
Brazil	:	0.78	22.85	0.20	8.50	14.85	0.48
India	:	0.04	3.77	0.00	2.05	1.70	0.05
Major importers 4/	:	1.13	36.36	27.57	62.71	1.23	1.12
EU-25	:	0.85	11.23	22.75	33.61	0.36	0.86
China	:	0.00	23.27	0.08	22.52	0.82	0.00
2005/06 (Projected)							
World 2/	:	3.62	143.81	46.73	143.10	47.30	3.76
United States	:	0.23	36.50	0.15	30.53	6.12	0.23
Total foreign	:	3.39	107.31	46.58	112.58	41.18	3.53
Major exporters 3/	:	1.21	50.06	0.10	12.71	37.33	1.33
Argentina	Jul	0.68	21.05	0.00	1.00	20.00	0.73
Brazil	Jul	0.48	24.60	0.10	9.40	15.23	0.55
India	Jul	0.05	4.41	0.00	2.31	2.10	0.05
Major importers 4/	:	1.12	39.51	28.33	66.60	1.24	1.12
EU-25	Jul	0.86	11.40	23.30	34.29	0.39	0.87
China	Jul	0.00	26.37	0.05	25.62	0.80	0.00

1/ Data based on local marketing years except for Argentina and Brazil which are adjusted to an October-September year. 2/ World imports and exports may not balance due to differences in local marketing years and to time lags between reported exports and imports. Therefore, world supply may not equal world use. 3/ Argentina, Brazil, and India. 4/ Eastern Europe, China, EU, and Southeast Asia (includes Indonesia, Malaysia, Philippines, and Thailand).

Table 5

USDA-WASDE World Soybean Oil Supply and Use 1/
(Million Metric Tons)

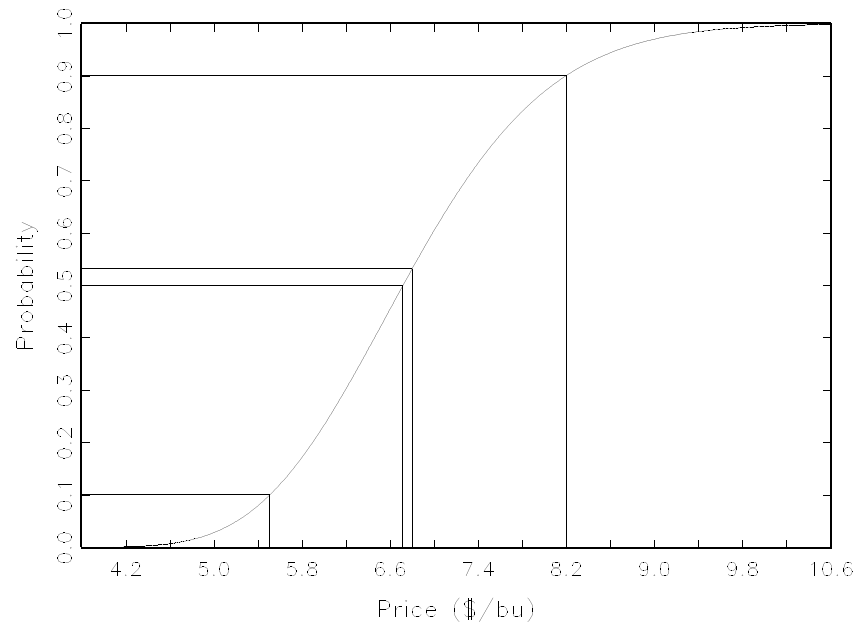
=====							
	:	Supply		:	Use		:
	:	=====		:	=====		:
Region	:	:	:	:	:	:	Ending
	:	Beginning	Produc-	:	Total	:	stocks
	:	stocks	tion	Imports	Domestic	Exports	:
=====							
	:						
	:	2003/04					
World 2/	:	1.97	29.88	8.35	29.67	8.98	1.55
United States	:	0.68	7.75	0.14	7.65	0.42	0.49
Total foreign	:	1.30	22.13	8.21	22.01	8.56	1.07
Major exporters 3/	:	0.38	12.68	0.08	5.10	7.70	0.34
Argentina	:	0.05	4.51	0.00	0.11	4.41	0.04
Brazil	:	0.10	5.64	0.03	2.95	2.72	0.10
EU-25	:	0.23	2.54	0.04	2.03	0.57	0.21
Major importers 4/	:	0.38	5.57	3.54	9.02	0.03	0.44
China	:	0.25	4.54	2.73	7.17	0.02	0.33
India	:	0.13	1.02	0.76	1.78	0.02	0.11
Pakistan	:	0.01	0.01	0.05	0.07	0.00	0.01
	:						
	:	2004/05 (Estimated)					
World 2/	:	1.55	31.86	9.31	31.49	9.42	1.80
United States	:	0.49	8.72	0.05	7.85	0.64	0.77
Total foreign	:	1.07	23.14	9.26	23.65	8.79	1.04
Major exporters 3/	:	0.34	12.87	0.14	5.11	7.90	0.35
Argentina	:	0.04	4.70	0.00	0.12	4.55	0.07
Brazil	:	0.10	5.63	0.05	3.01	2.66	0.10
EU-25	:	0.21	2.55	0.09	1.98	0.68	0.19
Major importers 4/	:	0.44	6.14	3.81	9.95	0.03	0.42
China	:	0.33	5.25	2.15	7.47	0.02	0.24
India	:	0.11	0.87	1.60	2.40	0.01	0.17
Pakistan	:	0.01	0.02	0.06	0.08	0.00	0.01
	:						
	:	2005/06 (Projected)					
World 2/	:						
July	:	1.80	33.47	9.86	33.28	10.06	1.80
United States	:						
July	:	0.77	8.65	0.05	8.01	0.70	0.76
Total foreign	:						
July	:	1.04	24.82	9.81	25.27	9.36	1.04
Major exporters 3/	:						
July	:	0.35	13.53	0.07	5.18	8.43	0.33
Argentina	Jul	0.07	4.89	0.00	0.14	4.77	0.05
Brazil	Jul	0.10	6.04	0.03	3.10	2.97	0.10
EU-25	Jul	0.19	2.59	0.04	1.94	0.70	0.18
Major importers 4/	:						
July	:	0.42	7.02	4.31	11.27	0.02	0.45
China	Jul	0.24	5.97	2.60	8.55	0.01	0.25
India	Jul	0.17	1.02	1.65	2.64	0.01	0.19
Pakistan	Jul	0.01	0.02	0.06	0.08	0.00	0.01
	:						
=====							

1/ Data based on local marketing years except for Argentina and Brazil which are adjusted to an October-September year. 2/ World imports and exports may not balance due to differences in local marketing years and to time lags between reported exports and imports. Therefore, world supply may not equal world use. 3/ Argentina, Brazil and EU. 4/ India, China and Pakistan.

Figure 1

DATE Fri Jul 22 20:43:40 2005

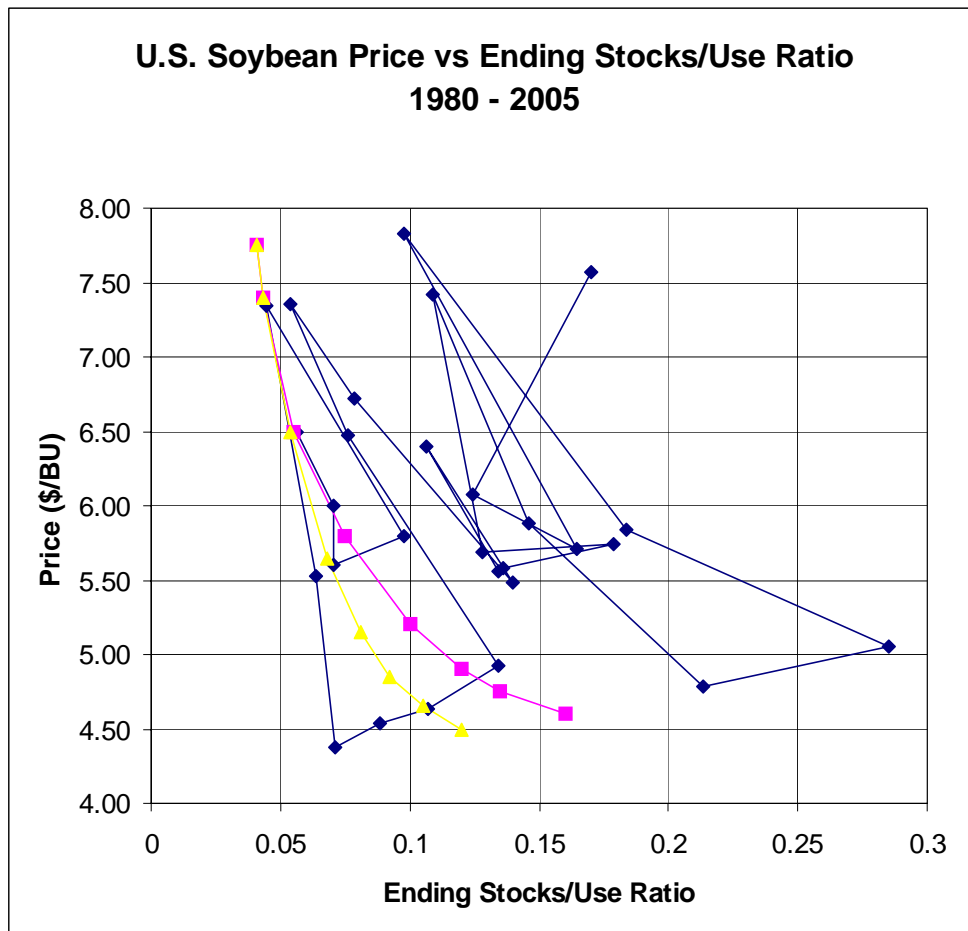
Cumulative Distribution Function November 2005 Soybean Futures



Current Futures Price = 6.7950000
Standard Error of Futures Price Distribution at Maturity = 1.0602821
Median of Futures Price Distribution at Maturity = 6.7137581

perc 0.1 = 5.5048497
perc 0.2 = 5.8936409
perc 0.3 = 6.1935369
perc 0.4 = 6.4584129
perc 0.5 = 6.7137581
perc 0.6 = 6.9900322
perc 0.7 = 7.2889715
perc 0.8 = 7.6598684
perc 0.9 = 8.2008621

Graph 1



Sensitivity Analysis

- Price change for a 10 million bushel change in ending stocks, relative to the Ending Stocks-to-Use Ratio and Relative Use. Average of the above two curves, i.e., a Hilker estimation.

<u>E/S to Use Ratio</u>	<u>Price Change for 10 million change</u>
.04	\$0.50
.05	\$0.20
.07	\$0.15
.09	\$0.10
.10	\$0.07
.12	\$0.05
.14	\$0.02