U.S. Soybean Situation and Outlook for 2004/2005

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Plantings and Production

According to the USDA September 10th, 2004 World Agricultural Supply and Demand Estimates report shown in Table 1, U.S. farmers planted an estimated 74.8 million acres to soybeans in 2004, 1.4 million acres more than last year (up 1.9 percent). This estimate of planted acres is revised downward 0.6 million acres from the March Prospective Plantings projection of 75.4 million acres. The prospective planting survey reported that the increase in soybean acres was poised to be the largest on record. The prospective planting projections also report that the popularity of herbicide resistant soybeans has continued this year with producers intending to plant 86 percent of soybean acreage to herbicide resistant varieties in 2004 compared to 81 percent in 2003. All soybean growing states except South Dakota and Wisconsin intended to plant more or at least as many acres of soybeans as the previous year. High prices were the underlying reason cited for an increase in acreage. Despite being trimmed 0.6 million acres, the September projection of 74.8 million acres represents the largest U.S. planted acreage on record and represents an end to the three year decline in planted acreage of 2001, 2002, and 2003. The new record 74.8 million acres is 0.5 million acres more than the previous record 74.3 million acres in 2000. Of the 74.8 million acres of soybeans planted nationally, about 73.7 million acres will be harvested. If yields average the projected 38.5 bushel per acre, a crop of 2.836 billion bushels will be produced. This represents a 13.3 percent increase from the previous year, and is approaching the record 2.891 billion bushels in 2001.

On a more aggregate level the combined acreage of the major row crops in the U.S. in 2004 (corn, soybeans, corn, and wheat) is up 1.98 million acres (0.87 percent) to

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254.163 million acres. Interestingly, projected planted corn acreage in 2004 also increased a dramatic 2.3 million acres compared to the previous year (78.7 million acres) and represents the largest planted acreage in almost 20 years going back to 1985 when planted acreage was 83.4 million acres. Projected cotton acreage in 2004 is also up 2.08% over the previous year, whereas wheat acreage is projected to decline -3.24%.

Table 2 shows that projected harvested acres for soybeans in the Southeast region are predicted to increase from the previous year's 10.485 million acres to 11.330 million acres, an increase of 8.1 percent. Following the national trends, acreage in all of the states in the Southeast region is projected to increase. Of the five largest soybean producing states of in the Southeast region (AR, MS, KY, NC, and TN), all which are in excess of one-million acres, by far the largest increase in acreage occurred in Mississippi with 200,000 additional acres or 14% more soybean acres than the previous year. Notably, despite the substantial increased acreage, only 5 of 12 states are projected to experience an increase in yield from last year (AR, NC, VA, OK, and TX). The expected average yield for the Southeast region is 34.1 bushels per acre, which represents a very slight decline from last year's 34.2 bushels per acre. Several Southeast region states are expected to have yields that are higher than the average U.S. yield of 38.5 bu/ac. These states include AR (39), KY (41), and TN (39). Overall, production in the Southeast region is expected to be 410 million bushels, a 6.9 percent increase from 2003 levels. This increase is consistent with the national scenario but less dramatic due to the slight decline in average yield in the Southeast region. It is projected that the Southeast region will account for 14.4 percent of total U.S. production for the 2004 crop. This represents a decline over the previous year's share of 15.8 percent, a decline in share of 8.9 percent.

Prospects for Yields

The USDA initial projections (12th May 2004, WASDE) called for an average yield of 40.0 bu/ac for the U.S. in 2004. This projection has tempered since, downgraded in June and July reports to 39.9 bu/ac, 39.1 bu/ac in August, and in the most recent September report to 38.5 bu/ac. The reasons cited for the overall lower

yield prospects were less than perfect conditions in the upper Midwest. This reduction of 1.5 bu/ac represents a decline in total production of 111 million bushels (on the expected 73.7 million acres to be harvested). Interestingly, this projected reduction is more than half of the anticipated ending stocks of 190 million bushels for 2004-05.

Crop condition reports for the week ending September 12th were: 15% excellent, 48% good, 26% fair, 8% poor, and 3% very poor. These crop conditions are far superior to conditions compared with the same time a year ago but this is not a very illuminating comparison since last year's crop only made a 33.4 bu/ac yield. Current projected ending stocks still remain quite tight at 190 million bushels, although this is considerably more than the previous year's 105 million bushels, it is still below the 7-year average level of 225 million bushels. Any further dwindling of expected yield in the months to come as harvest gets into full swing and better information is available will lead to further tightening of ending stocks and there will be a swift upward price response. Holding current use constant, average yields would have to shrink only a further 2 bu/ac (5.2%) for stocks-to-use to fall below 5%, retreating to the similar levels of the previous year where the season average price was $7.35 bu, or $1.55 bu higher than the midpoint ($5.80 bu) of the current projected range of $5.35-$6.25 bu. Clearly, when ending stocks are below average any further reductions in yield will induce a significant positive price response to bring about the rationing in demand required in light of a smaller supply on hand.

Demand Side

The demand side of the balance sheet for 2004-05 improves considerably over the previous year with a 10.5 percent increase in total use. This increase is composed of a 5.2% increase in crush and 13% increase in exports. This turnaround in use represents a departure from the previous two marketing years where total use, crush, and exports were significantly below the previous record levels of 2001-02. Although 2004-05 use levels do not represent a full recovery, falling 175 million bushels short of the record 2.933 billion bushels in 2001-02, it does represent a substantial rebound.

Internationally, world total crush is projected to increase 8.7% this year at 6.608 billion bushels. Looking at the projected breakdown of the major players is illuminating

with South America crush at 2.236 billion bushels [Argentina (0.963 billion bushels) and Brazil (1.274 billion bushels)]. The next largest crusher is the U.S. at 1.615 billion bushels, next is China with 1.021 billion bushels, and then EU-25 with 0.570 billion bushels. The 8.7% growth in crush in the 2004-05 compared to 2003-04 stems from a 5.19% increase in the U.S., a 10.76% increase in South America, a 9.32% increase in China, and a 6.02% increase in the EU-25. It is noteworthy that the increase in crush in South America and China for this year compared to the previous year is about twice that of the U.S. This observation should act as a heads-up to the U.S. soybean complex and livestock industry about more longer-run consequences and strategic implications of these value added players and the location of world's crushing capacity. As well as being the largest crusher, South America is now also the largest exporter of soybeans with 2004-05 exports projected at 1.137 billion bushels compared with 1.000 billion bushels for the U.S. The majority of these exports are destined for China which is projected to import 0.827 billion bushels and the EU-25, 0.594 billion bushels. Clearly, China is positioning itself as a supplier of crush capacity or value added with imports of 0.827 billion bushels and a crush of 1.021 billion bushels.

Overall, the strengthening in total use of 9.52% in 2004-05 is not enough to fully offset the substantial projected increase in world supply of 18.28%, meaning an increase in world ending stocks of 37.96 million bushels. This increase in world ending stocks releases some of the pressure on world price that transpired the previous year.

Price Prospects

The USDA is currently projecting a season average soybean price of $5.35-$6.25 bu with a midpoint of $5.80 bu. This is well below the previous year's season average of $7.35 bu. A season average soybean price of $5.80 bu is also well above the new loan rate for soybeans of $5.00 bu and would preclude farmers from receiving LDP's and possibly even a counter-cyclical-payment in 2004-05.

At the time of this writing the November 2004 soybean futures were trading around the $5.44 bu level. There is a small carry on offer with March 2005 trading at $5.51 bu, or carry of $0.07 bu, which makes the prospect of storing soybeans unfavorable. As is becoming more common place for soybean futures, a historical chart

of the November 2004 futures reveals that it has been a volatile ride in the soybean market the past year. For example, the November 2004 contract traded a 2003 harvest time low of $4.83 bu rallying to a 2004 planting time high of $8.02 bu, before tailing off to current levels of $5.40 bu. This trading range of $3.20 bu in a calendar year is substantial and represents a significant price risk. For farmers who failed to lock in the planting time price levels around the $7.80-$8.00 bu levels the $5.40 bu price level on offer now represents a significant opportunity lost to the tune of $2.00 bu to $2.40 bu.[1] For those who did some forward pricing, hedging, or set a price floor around pre-planting or planting time, this year these strategies promise to pay handsomely for being good risk managers.

More recent daily charts of the November 2004 futures reveal a gap and 1st resistance level at the $5.90 bu level and a 1st support developing in the last week or so around the $5.40 bu level. The trend in September 2004 has been downward and it remains to be seen whether the $5.40 bu resistance level forms a longer-term bottom. Several marketing newsletters are claiming that the bottom is in but it is this analyst's (punter's) opinion this claim is premature and not supported at this stage. The market has been trading more recently in a tight range trying to decide exactly what the production in the U.S. this year will be and it might not be until the October report that we have a clearer picture. The reliability tables in the WASDE reveal that the average difference in the September production projections versus the final estimate of the period 81/82-03/04 is 4.6 percent, being below the final estimate 11 times and above 12 times.

Farmers who have not done any pricing should be focused over the next few weeks and pay strict attention to the October projections which should be more informed by field data about the status of this year's crop. Once a clearer picture on the yield prospectus is obtained, look for the market to break out of its current right range of $5.40-$5.50 bu levels we have seen this week (the week beginning September 20th). If the consensus is that the crop is smaller than expected we should see the market rally and make a run for filling the gap that begins at the $5.94 bu level. If the news is

[1] For further discussion about soybean seasonal nearby futures tendency and the recent favorable levels during the January through April time frame see Piggott, Shumaker, and Curtis (2003).

favorable, that the crop is larger than expected, we should see the market decline further and test a 2nd support level at around the $5.28 bu level. Those farmers who have not done any pricing should look to the rally to do some pricing with realistic expectations around the $5.90 bu level, this is especially important for farmers who have little on-farm storage given the poor carries on offer. If the rally does not occur, and the yield news is favorable, prices will likely decline quickly making a retreat to the $5.28 bu level, especially with the projected production levels in South America in 2004-05. The marketing options at this stage under this scenario seem limited. A wait and see approach storing soybeans and holding out for planting woes in the South American market for pricing opportunities might offer the most promise. Something less than perfect growing conditions will lead to a tightening of world supplies. So herein lies the key to post harvest price prospects for the U.S. soybean market. Any adverse weather in the South American growing season should have a positive and significant impact on post harvest U.S. prices.

A few final parting thoughts. This analyst is currently perplexed by and is endeavoring to investigate more rigorously with empirical methods and data the casual observations and notion that with the arrival of the South American soybean industry as the major player and supplier of soybeans the soybean market appears to have become more volatile. Intuition would suggest that the presence of the two major suppliers located in different hemispheres enabling a two shot deal in supplying the world market needs (a natural production hedge) should mean a more stable supply. However, the market price data (as exemplified in the November 2004 contract this past year trading a range in excess of $3.00 bu) appears to be increasingly more volatile with price risks seemingly greater. This has not yet been confirmed empirically by the author at this time and is postulated here but is a testable hypothesis under investigation as work in progress. Clearly, structural change in the supply side of the market means that the U.S. balance sheet and page 13 of the WASDE is less important than it used to be and it is more important to consider the world balance sheet and page 26 of the WASDE. So the central question is—Is the market truly more volatile (demand and supply more uncertain) or is the prominence of a larger number of significant players being involved resulting in a more complex price discovery mechanism that punters are still trying to

understand responsible for this volatility? Stated differently, one wonders whether the fact that market information from South American and China which is less transparent than information pertaining to the U.S., but at the same time increasingly important to the price discovery mechanism, a contributing factor to the increased volatility we have seen in the recent times? Or are the more subtle but just as important underlying structural changes that are occurring in the supply side and the processing and product markets (meal and oil) of the soybean complex contributing to this volatility? Or is it both, and if so, what is relative magnitudes and contribution of each toward this volatility?

Two things known for sure are that under this new integrated world market, price risk management and good marketing decisions by soybean producers have never been more important! Also the need for improved economic analysis and models in making projections and policy decisions is paramount given the complexity of the economic relationship of joint products in a multi-region and international setting.

Table 1: USDA SUPPLY/DEMAND BALANCE SHEET FOR SOYBEANS
September 10, 2004

	97-98	98-99	99-00	00-01	01-02	02-03	Est. 03-04	**Proj. 04-05**	Aver. 7yr 97-04	% change 04-05 03-04	% change 04-05 7-yr
				(Million Acres)							
Acres Planted	70	72	73.7	74.3	74.1	74.0	73.4	**74.8**	73.1	**1.9**	**2.4**
Acres Harvested	69.1	70.4	72.4	72.4	73.0	72.5	72.3	**73.7**	71.7	**1.9**	**2.7**
Bu./Harvested Acre	38.9	38.9	36.6	38.1	39.6	38.0	33.4	**38.5**	37.6	**15.3**	**2.3**
				(Million Bushels)							
Beginning Stocks	132	200	348	290	248	208	178	**105**	229	**-41.0**	**-54.2**
Production	2,689	2,741	2,654	2,758	2,891	2,756	2,418	**2,836**	2,701	**17.3**	**5.0**
Imports	5	3	4	4	2	5	6	**6**	4	**0.0**	**44.8**
Total Supply	2,826	2,944	3,006	3,052	3,141	2,969	2,602	**2,947**	2,934	**13.3**	**0.4**
Use:											
Crushing	1,597	1,590	1,578	1,640	1,700	1,615	1,535	**1,615**	1,608	**5.2**	**0.4**
Exports	873	801	973	996	1,064	1,044	885	**1,000**	948	**13.0**	**5.5**
Seed, Feed & Residuals	156	205	165	169	169	130	76	**143**	153	**88.2**	**-6.4**
Total Use	2,626	2,596	2,716	2,804	2,933	2,791	2,497	**2,758**	2,709	**10.5**	**1.8**
Ending Stocks	200	348	290	248	208	178	105	**190**	225	**-14.4**	**-15.7**
Ending Stocks, % of Use	7.6	13.4	10.7	11.7	7.1	6.4	4.2	**6.9**	8.7	**-10.1**	**-21.0**
U.S. Season Average Farm Price, $/ Bu.	$6.47	$4.93	$4.63	$4.54	$4.38	$5.53	$7.35	**$5.80 $5.35-$6.25**	$5.40	**26.3**	**7.3**

Source: Sept 10, 2004 USDA, WASDE

Table 2: Soybeans: Area Harvested, Yield and Production by State and U.S. 2003 and Forecasted Sept. 1, 2004

State	Area Harvested			Yield			Production		
	2003	2004	%Δ	2003	2004	%Δ	2003	2004	%Δ
	(000's acres)			(Bushels/Acre)			(000's bushels)		
Southeast Region									
AR	2,890	3,050	5.5	38	39	2.6	109,820	118,950	8.3
MS	1,430	1,630	14.0	39	37	-5.1	55,770	60,310	8.1
KY	1,240	1,270	2.4	43	41	-4.7	53,320	52,070	-2.3
NC	1,400	1,400	0.0	30	32	6.7	42,000	44,800	6.7
TN	1,120	1,140	1.8	41	39	-4.9	45,920	44,460	-3.2
LA	740	950	28.4	34	31	-8.8	25,160	29,450	17.1
VA	480	490	2.1	34	36	5.9	16,320	17,640	8.1
SC	420	450	7.1	28	26	-7.1	11,760	11,700	-0.5
OK	245	290	18.4	26	32	23.1	6,370	9,280	45.7
GA	180	240	33.3	33	30	-9.1	5,940	7,200	21.2
TX	180	225	25.0	28	31	10.7	5,040	6,975	38.4
AL	160	195	21.9	36	35	-2.8	5,760	6,825	18.5
Total SE Region	10,485	11,330	8.1	34.2	34.1	-0.2	383,180	409,660	6.9
Total U.S.	72,321	73,655	1.8	33.4	38.5	15.3	2,417,565	2,835,989	17.3
SE % of U.S	14.5	15.4	6.1	102.3	88.5	-13.5	15.8	14.4	-8.9

Source: Crop Production: Released September 10, 2004, by the National Agricultural Statistics Service (NASS), Agricultural Statistics Board, U.S. Department of Agriculture, USDA.
Notes: %Δ denotes the percentage change.

References

Piggott, N. E., Shumaker G.A., and C. C. Curtis. “Grain Marketing and Analysis of Basis and Risk Management Strategies for Georgia, North Carolina, and South Carolina.” Draft version, September 2003. http://www.ag-econ.ncsu.edu/faculty/piggott/handbook.htm

United States Department of Agriculture, National Agricultural Statistics Service, Prospective Plantings March 31st, 2004. http://usda.mannlib.cornell.edu/reports/nassr/field/pcp-bbp/

United States Department of Agriculture, World Agricultural Supply and Demand Estimates, September 10th, 2004. http://usda.mannlib.cornell.edu/usda/reports/waobr/wasde-bb/2004/

United States Department of Agriculture, National Agricultural Statistics Service, Crop Production September 10th, 2004. http://usda.mannlib.cornell.edu/reports/nassr/field/pcp-bb/2004/

United States Department of Agriculture, National Agricultural Statistics Service, Crop Progress September 13th, 2004. http://usda.mannlib.cornell.edu/reports/nassr/field/weather/2004/