

Grain Marketing: Using Balance Sheets

Introduction

Grain balance sheets are estimates of supply and demand. They are the key to understanding the grain markets. A grain farmer who understands how to interpret balance sheets is able to incorporate new market information as it develops and to adjust his or her price forecasts accordingly. This fact sheet describes domestic and world balance sheets for corn, soybeans and wheat.

Domestic Balance Sheets: Corn

Table 1 shows the domestic balance sheets for corn for the current and the last three marketing years. As illustrated, total supply - total usage (demand) = ending stocks. Total supply consists of three factors: stocks, production and imports. Total usage also consists of three factors: food/seed, feed/residual and exports. Ending stocks are subdivided into two categories: privately owned stocks and Commodity Credit Corporation (CCC) stocks.

Important Definitions

Total Supply. This is the total amount of corn that was or is expected to be available during a marketing year. The stocks figure is the amount of corn in inventory available at the beginning of a marketing year (for example, September 1, 19XX). The beginning stocks figure quoted in the supply section is equal to the ending stocks figure from a previous marketing year. For example, the stocks figure of 4,040 million bushels for the 1986-87 marketing year is equal to the 1985-86 ending stocks. Production is the amount of corn harvested or expected to be harvested during a marketing year. For the 1988-89 marketing year, 4,553 million bushels of corn are expected to be harvested during the fall. Imports are the amount of corn imported or expected to be imported into the U.S. from foreign origins during a marketing year. For example, for the 1985-86, 1986-87 and 1987-88 marketing years, the imports number is the actual amount of corn imported. For the 1988-89 year, the imports figure is estimated through August 31, 1989.

Total Usage. This describes how the available corn was or is expected to be used. It is an estimate of demand. The food/seed component is the amount of corn that was used or is expected to be used domestically for human consumption or seed. Feed is the amount of corn that was used or is expected to be used domestically for animal consumption. Residual is a catchall category that is used to ensure that the total of the components adds up to total usage. In Table 1, the feed and residual categories are combined. Exports are the amount of grain that is exported to foreign destinations or is expected to be exported to foreign destinations during the marketing year.

Ending Stocks. These are the amount of corn in inventory or expected to be in inventory at the end of a marketing year (for example, August 31, 19XX). Privately owned stocks are the corn in ending inventory

which are under the control of grain producers. Privately owned stocks consist of farmer owned reserves, stocks under loans, and free stocks (grain stored by the producer which is not attached to a government program). CCC stocks are corn stocks owned and controlled by the Commodity Credit Corporation.

Table 1 illustrates a close correlation between the ending stocks figure and the average price received by farmers during a marketing year. Price may be viewed as the mechanism which rations supply. By late fall, supply is fixed with the exception of imports. In periods of tight supply, prices rise and available supply is rationed until the next harvest. In periods of abundant supplies, prices fall or remain low to encourage the use of available supply. During the 1985-86 marketing year, ending stocks were 4,040 million bushels and farmers received an average price of \$2.35 per bushel. As ending stocks jumped to 4,882 million bushels the next marketing year, the average price which farmers received for corn fell to \$1.50 per bushel. Although the average corn price for the 1988-89 marketing year is yet unknown, many are expecting it to range from \$2.40 to \$2.80 a bushel. This is a response to the summer drought of 1988 and its corresponding projected ending stocks of 1,407 million bushels (33 percent of the 1987-88 ending stocks).

Table 1. Domestic supply and usage report for corn
(millions of bushels)^a

	Marketing Year			
	1985-86	1986-87	1987-88	1988-89 ^b
Supply				
Stocks	1,648	4,040	4,882	4,260
Production	8,877	8,250	7,064	4,553
Imports	<u>11</u>	<u>2</u>	<u>5</u>	<u>5</u>
Total	10,536	12,291	11,950	8,817
Usage				
Food/seed	1,160	1,191	1,224	1,210
Feed/residual	4,095	4,715	4,746	4,500
Exports	<u>1,241</u>	<u>1,504</u>	<u>1,720</u>	<u>1,700</u>
Total	6,496	7,410	7,690	7,410
Ending Stocks				
Privately owned	3,494	3,439	3,425	n/a
CCC stocks	546	1,443	835	n/a
Average Price	2.35	1.50	1.94	?

^a The corn marketing year runs from September 1 to August 31.

^b Projected October 13, 1988.

Ending stocks can be an indicator of the fundamental economic situation of a market. Since ending stocks are the difference between supply and usage, they encompass both supply and demand. Through ending stocks, new market information can be easily incorporated into a farmer's analysis of the market. For example, if the U.S. sells additional corn to Japan in an unexpected sale, a quick way to summarize the significance of the sale is to look at the impact on projected ending stocks. Similarly, information about the impacts of a drought, increases or decreases in livestock or poultry numbers, planting or

harvest problems, or a variety of other types of information can be quickly summarized through their impacts on ending stocks. Although not a perfect measure, ending stocks can at least give a grain producer an indication of whether the new information is significant or insignificant.

Another indicator of the fundamental situation is the *days supply* statistic. Days supply is computed directly from the balance sheet by dividing projected ending stocks with projected total usage, and multiplying the product by 365. For example, for the 1987-88 marketing year the days supply was 202 days ($[4260 - 7690] \times 365$). Because of the summer drought of 1988, the days supply is expected to drop to 69 days ($[1407 \div 7410] \times 365$). The correlation between average price for the crop year and days inventory is high, even higher than with ending stocks.

When using ending stocks, a farmer should pay attention to its composition. Trigger prices, loan rates and the specifics of government programs during a particular year, can have a big impact on the amount of stocks likely to become available. Similarly, government policy regarding the disposition of CCC stocks can have large impacts.

World Balance Sheets: Corn

Table 2 gives an abbreviated version of the world supply and usage reports for the current and the two previous marketing years. Like the domestic version, supply - demand = ending stocks. However, since corn is grown in different parts of the world with different growing seasons, the marketing year concept is more complex. For example, South American grain producers are harvesting their crop when U.S. producers are planting, and vice versa. World balance sheets are based on an aggregate of different marketing years. Also, instead of millions of bushels, world balance sheets are reported in millions of metric tons. For corn, a million metric tons equals approximately 40 million bushels.

Table 2. World supply and usage report for corn (millions of metric tons)^a

	Marketing Year		
	1986-87	1987-88 ^b	1988-89 ^c
Supply			
World Stocks	143.94	161.56	144.60
U.S. stocks	102.61	124.00	108.20
Foreign stocks	41.33	37.56	36.40
World Production	477.02	444.92	382.44
U.S. production	209.56	179.44	115.65
Foreign production	267.46	265.48	266.80
World Imports	61.13	63.38	67.47
U.S. imports	0.05	0.10	0.13
Foreign imports	61.07	63.27	67.35
Usage			
World Domestic for Feed	313.16	311.71	315.09
U.S. domestic for feed	119.74	120.56	114.31
Foreign domestic for feed	193.42	191.15	200.79
World Domestic Total	459.40	461.87	462.02
U.S. domestic total	150.01	151.65	145.04
Foreign domestic total	309.39	310.22	316.98
World Exports	62.59	63.71	65.83
U.S. exports	38.20	43.69	43.18
Foreign exports	24.39	20.02	22.65
Ending Stocks			
World	161.56	144.60	65.03
U.S.	124.00	108.20	35.75
Foreign	37.56	36.40	29.28
Exports of Major Foreign Exporters			
Argentina	4.03	4.10	4.60
China	3.70	3.70	3.50
South Africa	1.80	0.75	1.50
Thailand	2.92	0.80	3.10
Imports of Major Foreign Importers			
European Common Market (EC-12)	10.23	11.01	9.49
Japan	15.50	17.13	17.62
USSR	7.10	7.30	10.60

^a Aggregate of differing local marketing years. World imports and exports may not balance due to differences in marketing years, grain in transit, and reporting discrepancies in some

countries.

^b Estimated October 1988. ^c Projected October 1988.

The interpretation of world balance sheets is similar to the interpretation of domestic balance sheets. In 1986-87, the world had 113 days supply of corn ($[(161.56 \text{ ending stocks} \div (459.40 \text{ world domestic total usage} + 62.59 \text{ world exports})) \times 365]$) while in 1988-89, the world is projected to have 45 days supply ($[(65.03 \div (462.02 + 65.83))] \times 365$). Correlation of ending stocks and/or days supply with world price is high, but is less than the correlation of domestic ending stocks and/or days stocks with domestic price.

Since world balance sheets give statistics on major exporters and importers, additional information can be gleaned from the reports. For example, the reports show that the principal corn exporters are the United States, Argentina, China, South Africa and Thailand. For the 1987-88 marketing year, the United States had over two-thirds of all world corn exports ($43.69 \text{ U.S. exports} \div 63.71 \text{ world exports}$) with the major exporters accounting for another 15 percent ($[4.10 \text{ Argentine exports} + 3.70 \text{ Chinese exports} + 0.75 \text{ South African exports} + .80 \text{ Thailand exports}] \div 63.71 \text{ world exports}$). Japan, the European Common Market (EC-12) and the USSR were the most important world buyers of corn accounting for over 50 percent of world imports ($[17.13 \text{ Japanese imports} + 11.01 \text{ EC-12 imports} + 7.30 \text{ USSR imports}] \div 63.38 \text{ world imports}$).

While giving a general picture of the world grain markets, world balance sheets are not as important as domestic balance sheets for the individual grain farmer. U.S. exports have a more direct impact on local cash corn prices and are reflected on domestic balance sheets. An understanding of world balance sheets, however, gives the farmer insight on the global situation and lessens the probability of misleading an individual decisionmaker with information not relevant to local prices. The interpretation of world balance sheets also allows the farmer to provide more informed input to producer commodity and lobbying organizations.

Domestic Balance Sheets: Soybeans

Table 3 shows domestic supply and usage reports for soybeans for the current and the three previous marketing years. Interpretation of the reports is very similar to the domestic balance sheet for corn in Table 1. The components of the supply section of the report are the same as the corn balance sheet. In the usage section of the reports, the categories are: crush, exports, seed/residual. These categories reflect different uses for the U.S. soybean crop. The relationship between supply, usage and ending stocks is the same as with corn balance sheets. The correlation between ending stocks and average price is similarly high.

The computation of days supply in the reports show that days supply has fallen every year from a high of 104 days in 1985-86, to a low of 28 days projected for 1988-89. With 28 days supply projected for 1988-89, relatively small changes in projected supply and/or usage have dramatic impacts on projected ending stocks. Hence, one would expect the markets to react strongly to changes in planted acreage, exports or anything which could affect yields.

Table 3. Domestic supply and usage report for soybeans (millions of bushels)^a

	Marketing Year			
	1985-86	1986-87	1987-88	1988-89 ^b
Supply				
Stocks	316	536	436	302
Production	2,099	1,940	1,923	1,501
Imports	<u>11</u>	<u>2</u>	<u>5</u>	<u>5</u>
Total	2,415	2,476	2,359	1,803
Usage				
Crush	1,053	1,179	1,177	1,020
Exports	740	757	800	565
Seed/residual	<u>86</u>	<u>104</u>	<u>83</u>	<u>93</u>
Total	1,879	2,040	2,057	1,652
Ending Stocks	536	436	302	125
Average Price	5.05	4.78	6.15	?

^a The soybean marketing year runs from September 1 to August 31.

^b Projected October 13, 1988.

World Balance Sheets: Soybeans

Table 4 shows the world supply and usage reports for soybeans for the current and the two previous marketing years. Interpretation of the reports is similar to the world balance sheets for corn. For soybeans, one million metric tons is equal to approximately 40 million bushels.

The reports illustrate that world ending stocks have been dropping, with a 34 percent drop expected to occur for the current marketing year. The United States, Argentina and Brazil are the major exporters, accounting for nearly 90 percent of total world exports during the 1987-88 marketing year. The EC-12 is the most important importer but Japan is also important. Together they accounted for nearly 63 percent of world imports during the 1987-88 marketing year.

**Table 4. World supply and usage report for soybeans
(millions of metric tons)^a**

	Marketing Year		
	1986-87	1987-88 ^b	1988-89 ^c
Supply			
World Stocks	23.20	19.71	19.14
U.S. stocks	14.60	11.87	8.22
Foreign stocks	8.60	7.84	10.92
World Production	97.91	102.88	93.75
U.S. production	52.80	52.33	40.86
Foreign production	45.11	50.55	52.89
World Imports	29.40	29.13	26.12
U.S. imports	0.00	0.00	0.00
Foreign imports	29.40	29.13	26.12
Usage			
World Domestic Crush	85.09	84.78	82.71
U.S. domestic crush	32.09	31.95	27.76
Foreign domestic crush	53.01	52.83	54.95
World Domestic Total	102.29	102.86	100.59
U.S. domestic total	34.93	34.20	30.30
Foreign domestic total	67.36	68.66	70.29
World Exports	28.51	29.72	25.67
U.S. exports	20.60	21.77	15.38
Foreign exports	7.91	7.95	10.29
Ending Stocks			
World	19.71	19.14	12.75
U.S.	11.87	8.22	3.40
Foreign	7.84	10.92	9.35
Exports of Major Foreign Exporters			
Argentina	1.35	2.10	3.20
Brazil	3.29	2.70	3.90
Imports of Major Foreign Importers			
European Common Market (EC-12)	14.40	13.47	11.29
Japan	4.87	4.80	4.63

^a Aggregate of differing local marketing years. World imports and exports may not balance due to differences in marketing years, grain in transit, and reporting discrepancies in some countries.

^b Estimated October 1988.

^c Projected October 1988.

Domestic Balance Sheets: Wheat

Table 5 presents the domestic balance sheets for wheat for the current and the three previous marketing years. Interpretation is similar to the previously presented domestic balance sheets. The components of the supply and usage sections are the same as the corn domestic balance sheet. The table illustrates that ending stocks for wheat is not nearly as tight as soybean and corn ending stocks. The summer drought of 1988 had less of an impact on wheat.

Table 5. Domestic supply and usage report for wheat (millions of bushels)^a

	Marketing Year			
	1985-86	1986-87	1987-88	1988-89 ^b
Supply				
Stocks	1,425	1,905	1,821	1,256
Production	2,425	2,092	2,105	1,812
Imports	<u>15</u>	<u>21</u>	<u>16</u>	<u>15</u>
Total	3,865	4,018	3,942	3,083
Usage				
Food/seed	771	808	804	835
Feed/residual	274	385	291	270
Exports	<u>915</u>	<u>1,004</u>	<u>1,592</u>	<u>1,450</u>
Total	1,960	2,197	2,687	2,555
Ending Stocks				
Privately owned	1,298	1,821	1,256	528
CCC stocks	602	830	283	175
Average Price	3.08	2.42	2.57	?

^a The wheat marketing year runs from June 1 to May 31.

^b Projected October 13, 1988.

World Balance Sheets: Wheat

Table 6 presents world supply and usage reports for wheat for the current and the two previous marketing years. Interpretation is similar to previously presented world balance sheets.

The world balance sheets for wheat illustrate that the U.S., Argentina, Australia, Canada and the EC-12 are the most important exporters, with the U.S accounting for 38 percent of world exports during the 1987-88 marketing year. The Soviet Union and China are the most important importers accounting for 32 percent of world imports during 1987-88.

Table 6. World supply and usage report for wheat (millions of metric tons)^a

	Marketing Year		
	1986-87	1987-88 ^b	1988-89 ^c
Supply			
World Stocks	167.98	175.07	144.63
U.S. stocks	51.85	49.56	34.18
Foreign stocks	116.14	125.52	110.46
World Production	529.73	504.52	505.17
U.S. production	56.93	57.29	49.32
Foreign production	472.81	446.99	455.85
World Imports	98.92	112.89	103.49
U.S. imports	0.57	0.44	0.41
Foreign imports	98.35	112.45	103.08
Usage			
World Domestic for Feed	107.96	104.59	107.07
U.S. domestic for feed	11.23	7.91	7.35
Foreign domestic for feed	96.73	96.68	99.72
World Domestic Total	522.64	534.72	535.53
U.S. domestic total	32.46	29.79	30.07
Foreign domestic total	490.18	504.93	505.46
World Exports	102.08	115.57	105.82
U.S. exports	27.32	43.33	39.46
Foreign exports	74.75	72.24	66.35
Ending Stocks			
World	175.05	144.63	114.27
U.S.	49.56	34.18	14.37
Foreign	125.52	110.46	99.90
Exports of Major Foreign Exporters			
Argentina	4.44	4.20	3.70
China	3.70	3.70	3.50
Australia	15.65	9.90	11.80
Canada	20.78	23.50	11.70
European Common Market (EC-12)	28.04	27.68	30.70
Imports of Major Foreign Importers			
China	8.50	15.00	12.50
USSR	16.00	21.50	14.00

^a Aggregate of differing local marketing years. World imports and exports may not balance due to differences in marketing years, grain in transit, and reporting discrepancies in some

countries.

^b Estimated October 1988.

^c Projected October 1988.

Summary

Domestic and world balance sheets are useful tools for understanding and evaluating the grain markets. Projected ending stocks provide a useful means of summarizing new information as it becomes available during the marketing year. The correlation between domestic ending stocks and the average price received by farmers for their grain is high. World balance sheets help farmers in gaining a better understanding of the world grain marketing systems. Farmers, who take the time to understand world balance sheets, are better able to evaluate the usefulness of new information and to provide better input to producer and/or commodity associations.

This Extension fact sheet is one in a series of grain marketing fact sheets. The series is designed to cover many topics essential to effective grain marketing. Other fact sheets in the series are:

FS 484 Developing a Grain Marketing Plan
FS 486 Grain Marketing: Helpful Hints
FS 487 Grain Marketing: Storage Decisions
FS 488 Grain Marketing: The Futures Market
FS 489 Understanding Grain Basis
FS 490 Grain Marketing Alternatives
FS 491 Grain Futures: Questions and Answers
FS 492 Grain Marketing: Using Options
FS 493 Evaluating Grain Marketing Alternatives
FS 494 Crop Pricing Summary
FS 495 Maryland Corn: Historical Basis and Price Information
FS 496 Maryland Soybeans: Historical Basis and Price Information
FS 497 Maryland Wheat: Historical Basis and Price Information
FS 498 Producers' Guide to Grain Marketing Terminology

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