

GLOBAL SUPPLY AND DEMAND: CAN WE FEED THE WORLD? (S)

RISK AND PROFIT CONFERENCE 2008

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Current Grain Market Situation

- Wheat – Global production up 9%, demand for feed wheat and to replenish supplies, Middle East drought
- Corn/CGs – Global demand; U.S. ethanol demand; global stocks will be drawn down 3%
- Soybeans – Low U.S. carryover; Argentinean conflict resolved; Brazilian hectares?

Factors to Watch:

- Oil price/value of dollar
- Global S/D balances
- Weather remainder of season

DEMAND CONCLUSIONS

- Economic and income growth in developing countries will be sustained
- Global population will grow and people will improve their diets
- Livestock feeding and bio-processing demand will grow
- Global demand growth for grains and oilseeds will continue to put pressure on available supplies and prices

WORLD LAND AREA 36.8 BILLION ACRES

30% wasteland, cities, highways, etc.
28% forest
24% grass
13% annual crops
5% permanent crops

Sources: CIA World Fact Book, World Resources Institute, usinfo.state.gov, The World Food Outlook

Land in Crops

(Millions of acres)

	5 yr. Ave.	07/08USDA	08/09USDA ¹
Corn	79.6	93.6	87.0 (-7%)
Soybeans	74.2	63.7	73.3 (+15%)
Hay	62.4	61.6	60.4 (-2%)
Wheat	59.5	60.4	63.5 (+5%)
Cotton	14.1	10.9	9.25 (-15%)
Grain Sorghum	8.1	7.7	7.3 (-5%)
Principle Crops	297.9	297.9	302.25
CRP		35.9	34.9 (-3%)

¹USDA, WASDE, Released Aug 12, 2008.

Total crop land in the United States – 441.6 million acres

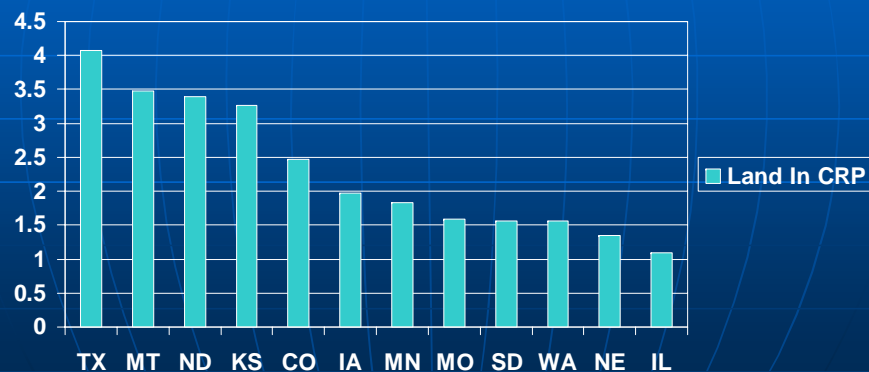
Crop Acres Coming Out of CRP, 2007–2017, Millions of Acres

Source: USDA, FSA



Land in CRP, Leading States, Millions of Acres

Source: USDA, FSA



Farm Land per Capita¹, 2008

Entity	Population	% of World ²	A./Cap ³
World	6,671,226,000	100.00	.73
China	1,325,264,000	19.87	.26
India	1,136,264,100	17.03	.36
U.S.	304,746,000	4.57	1.45
Indonesia	231,627,000	3.47	.26
Brazil	187,372,000	2.81	.80
Pakistan	163,953,000	2.46	.34
Bangladesh	158,665,000	2.38	.12
Nigeria	148,093,000	2.22	.60
Russia	141,888,900	2.13	2.10
Japan	127,690,000	1.91	.19
Mexico	106,682,500	1.6	.61

¹ Countries with less than 1/3 acre per person tend to be net importers.

² Countries with more than 100 million population; 60.45% of world total.

³ The world is losing about 24.7 million acres of farm land per year; -.49%.

Source: CIA World Fact Book.

Farm Land Endowment, Ten Leading Countries, 2008

Country	A./Cap
1. Australia	6.00
2. Kazakhstan	3.65
3. Canada	3.64
4. Niger	2.74
5. Russia	2.10
6. Argentina	1.81
7. Ukraine	1.70
8. Guyana	1.58
9. United States	1.45
10. Afghanistan	1.40

Source: www.nationmaster.com

TRENDS IN U.S. PRODUCTION AGRICULTURE

- FEWER, LARGER FARMS
- FACTORY-LIKE OPERATIONS
- GLOBAL MARKET ORIENTED

How many agricultural producers
could meet the world's needs for grain
and oilseeds?¹

200,000	≈	50%
500,000	≈	90%
1,000,000	≈	100%

¹ Assumes all producers are optimally sized for their circumstances.
(Can achieve full economies of size.)

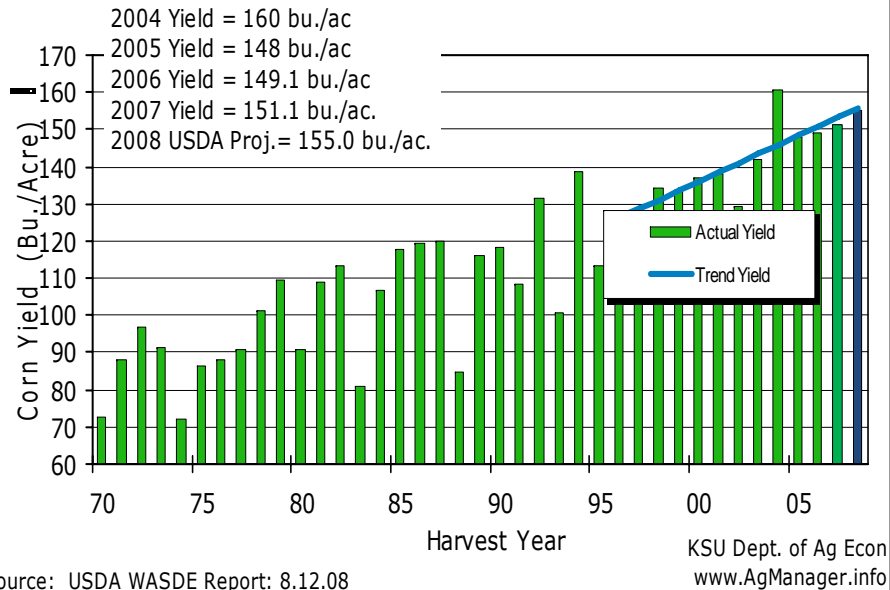
WORLD'S LARGEST CORN PRODUCERS, MMT, 2008/09 (Projected)

1. U.S.	312.1	(40%)
2. China	153.0	(19%)
3. EU-27	58.6	(7%)
4. Brazil	57.0	(7%)
5. Mexico	23.0	(3%)
6. Argentina	22.0	(3%)
7. India	18.0	(2%)
8. South Africa	11.5	(1%)
9. Canada	9.7	(1%)
10. Ukraine	9.5	(1%)

* **World Production 789.6**

Source: USDA, WASDE & PSD Reports, August 2008

U.S. Corn Yield



Corn and Water

Corn Production

Rule of thumb – 1" water \approx 9 bu. of corn per A.
 or 800 to 1,000 gallons of water per gallon of ethanol
 (Bu./ A./ inch of water: corn \approx 9; wheat \approx 4; soybeans \approx 3)

To grow 200 bu. corn requires about 22" of water during the 5 month growing season from rain, water stored in the root zone, or irrigation.

Ethanol Process Water

Grain – 3.5 to 5.5 gallons water per gallon of ethanol
 Cellulosic ethanol may require twice as much water per gallon

WORLD SOYBEAN TRADE, MMT 2008/09 (Projected)

Major Importers

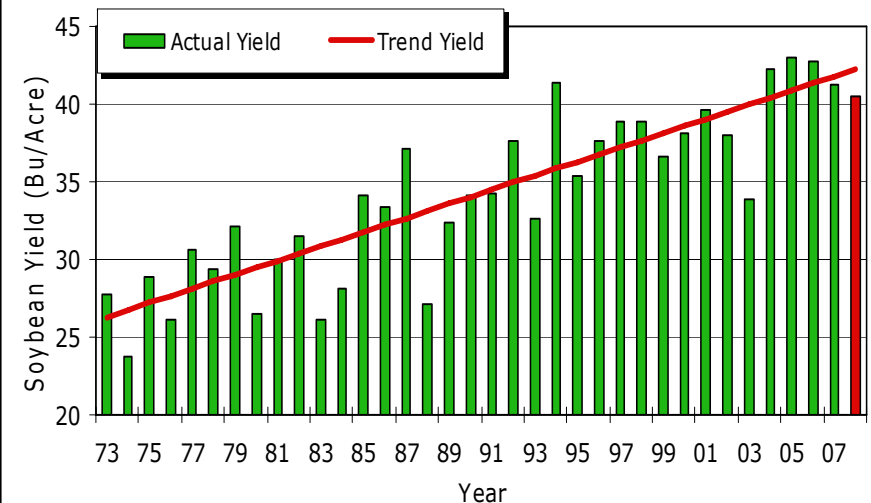
China	36.0 (47%)
EU-27	13.7
Japan	4.1
Mexico	3.6
Argentina	2.7

Major Exporters

Brazil	27.5 (36%)
U.S.	27.2 (36%)
Argentina	12.9

Source: USDA, WASDE Report, August 2008

U.S. Soybean Yields



KSU Dept. of Ag Econ
 www.AgManager.info

WORLD'S LARGEST RICE PRODUCERS, MMT, 2008/09 (Projected)

1. China	130.6	(30%)
2. India	96.0	(22%)
3. Indonesia	36.3	(8%)
4. Bangladesh	29.4	(7%)
5. Vietnam	23.7	(6%)
6. Thailand	18.8	(4%)
7. Philippines	11.0	(3%)
8. Burma	9.4	(2%)
9. Brazil	8.5	(2%)
10. Japan	7.9	(2%)

* World Production 430.8

Source: USDA, WASDE & PSD Reports, August 2008

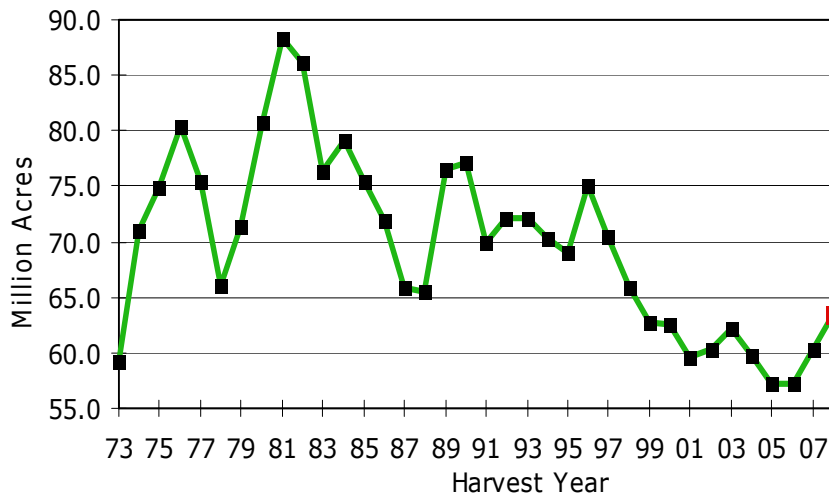
WORLD'S LARGEST WHEAT PRODUCERS, MMT, 2008/09 (Projected)

1. EU-27	143.2	(21%)
2. China	114.0	(17%)
3. India	78.4	(12%)
4. United States	67.0	(10%)
5. Russian Federation	57.0	(8%)
6. Canada	25.0	(4%)
7. Australia	25.0	(4%)
8. Ukraine	22.0	(3%)
9. Pakistan	21.5	(3%)
10. Turkey	16.5	(2%)

* World Production 670.8

Source: USDA, WASDE & PSD Reports, August 2008

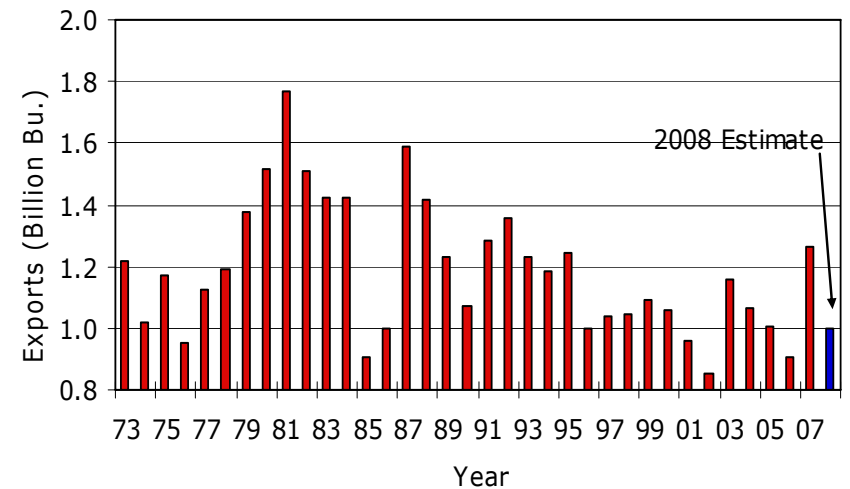
U.S. Wheat Planted Acreage



Source: USDA WASDE Report 8.12.08 & K-State Ag. Econ. Dept.

KSU Dept. of Ag Econ
www.AgManager.info

U.S. Wheat Exports



Source: USDA WASDE Report 8.12.08 & K-State Ag. Econ. Dept.

KSU Dept. of Ag Econ
www.AgManager.info

WORLD'S LEADING EXPORTERS, MMT, 2008/09 (Projected)

<u>Country/Region</u>	<u>Amount</u>	<u>Commodities</u>
United States	112.7	CG, SB, W, R
FSU-12	40.4	W, CG
Argentina	39.0	CG, SB, W
Brazil	37.1	SB, CG, R
EU-27	20.9	W, CG, R
Canada	20.5	W, CG
Australia	19.4	W, CG

Source: USDA, WASDE Report, August 2008

Agricultural Commodities and Energy

The United States and Oil

- Uses 20 million barrels per day
- Produces 6 million barrels per day
- Oil usage has increased 2% per year but the economy has been growing at 3.3% per year
- Cost to import 5 billion barrels of oil per year - \$600 to \$750 billion

The Largest Economies and Oil, 2007

1.	United States	\$13.812 Trillion
2.	Japan	4.377
3.	Germany	3.297
4.	China	3.2818
5.	United Kingdom	2.728
6.	France	2.563
7.	Italy	2.107
8.	Spain	1.429
9.	Canada	1.326
10.	Brazil	1.314
11.	Russia	1.291
12.	India	1.099

U.S. Oil Import Suppliers, 2008

1. Canada
2. Saudi Arabia (OPEC)
3. Mexico
4. Nigeria (OPEC)
5. Venezuela (OPEC)
6. Iraq (OPEC)
7. Angola (OPEC)
8. Algeria (OPEC)
9. Kuwait (OPEC)
10. Brazil

Source: Energy Information Administration

Price Effect of an Interruption in Oil Imports



Oil vs Corn

\$100 worth of:	Will make:
Oil ¹	16.6 gal. of gasoline 11.6 gal. of diesel
Corn ²	56 gal. of ethanol ≈ 40 gal. of gasoline

¹ \$120 per barrel

² \$5 per bushel

Corn Used to Make Ethanol, U.S.

	<u>Ethanol (bil gal.)</u>	<u>Bu.(bil)</u>	<u>% of Crop</u>
2006/07	5.7	2.1	20
2007/08	8.0	3.0	23
2008/09	11.1	4.1	33
2015 ¹	15.0	5.4	?

¹ The Renewable Fuel Standard calls for a maximum starch-based ethanol inclusion of 15 billion gallons by 2015.

Biofuel Impact: Small Increase in Supply, Large Decrease in Price



What would it take to replace imported transportation fuels?

To replace the OPEC gasoline (59 bgpy) with ethanol would require 31.9 billion bushels of corn. This year's production – 12 billion bushels.

To replace the OPEC diesel (27 bgpy) with soy-diesel would require 18 billion bushels of soybeans. This year's production – 3 billion bushels.

Sources of Total Renewable Energy Used, United States, 2006

■ Biomass (Biofuels)	48
■ Hydro	42
■ Geothermal	5
■ Wind	4
■ Solar	1

2007 Sense of Congress Resolution – 25% by 2025
Now 7%.

Source: U.S. Energy Information Administration

Fertilizer Situation

- Fertilizer prices have increased 2 to 4 times depending upon type
- No new nitrogen plants in the U.S. since the 1970s
- The U.S. now imports more than one-half of nitrogen needs and nearly all potash
- Fertilizer dealers have shifted inventory risk to farmers
- No relief for 2 to 3 years

Comparative Grain Prices, Dollars per Bushel

	<u>Ave.</u> ¹	<u>Now</u> ²	<u>Future</u> ³
Wheat	\$3.36	\$7.84	\$5.00
Corn	2.27	4.75	\$4.00
Grn Sorghum	2.20	4.33	\$3.50
Soybeans	5.64	12.06	\$7.50

¹ Average price per bushel, 2000-2006.

² Kansas City cash truck bids, 8 August 2008.

³ Suggested long term average price (estimated breakeven cost per bushel) to be used for planning purposes.

CONCLUSIONS

- Countries with large per capita land endowments will be major exporters
- Crop production patterns in the U.S. and elsewhere will shift
- Because of tight S&D balances, markets will be highly sensitive to weather variations
- Global production will increase given time to adjust
- Commodity prices may fall long term, but not to previous levels
- Global supply growth may be more constrained by energy than land or water