

Critical Trends in Agriculture

Presentation to The Fertilizer Institute



Rich Pottorff

Doane Advisory Services



Some Critical trends for Agriculture

- Trends in world grain production and use
 - Changes in world grain area
 - Changes in world yields
 - Implied surplus or deficit
- Demand growth in China and India (& elsewhere)
 - Impact of shifting diets
 - Impact of U.S. ethanol industry
 - Where does that leave the world corn market
- The resurgence of the Former Soviet Union
 - Impact on world grain markets
 - Outlook for the future

Some Trends for U.S. Agriculture

- Slower growth in demand
 - The end of the ethanol BOOM
 - Impact of seed technology

Changes in Crop Area (00-11)

million hectares

	Corn	Soybeans	Wheat	Cotton	Rape	Rice
Former USSR	2.1	1.7	8.9	-0.1	1.8	0.1
Brazil	0.8	10.3	0.7	0.4	NA	-0.3
Sub-Saharan Africa	6.5	0.4	-1.0	-0.4	0.0	1.9
Argentina	0.4	7.9	-2.1	0.2	NA	0.1
China	9.4	-0.8	-2.3	1.4	-0.4	-0.1
India	2.0	1.7	0.9	3.9	2.0	-0.4
United States	3.6	1.7	-2.2	-1.3	-0.2	0.2
Total	31.1	29.3	4.6	3.8	8.6	7.8
In acres	76.8	72.4	11.4	9.4	21.3	19.3



Total increase - more than 210 million acres

Major Crop Area Expansion

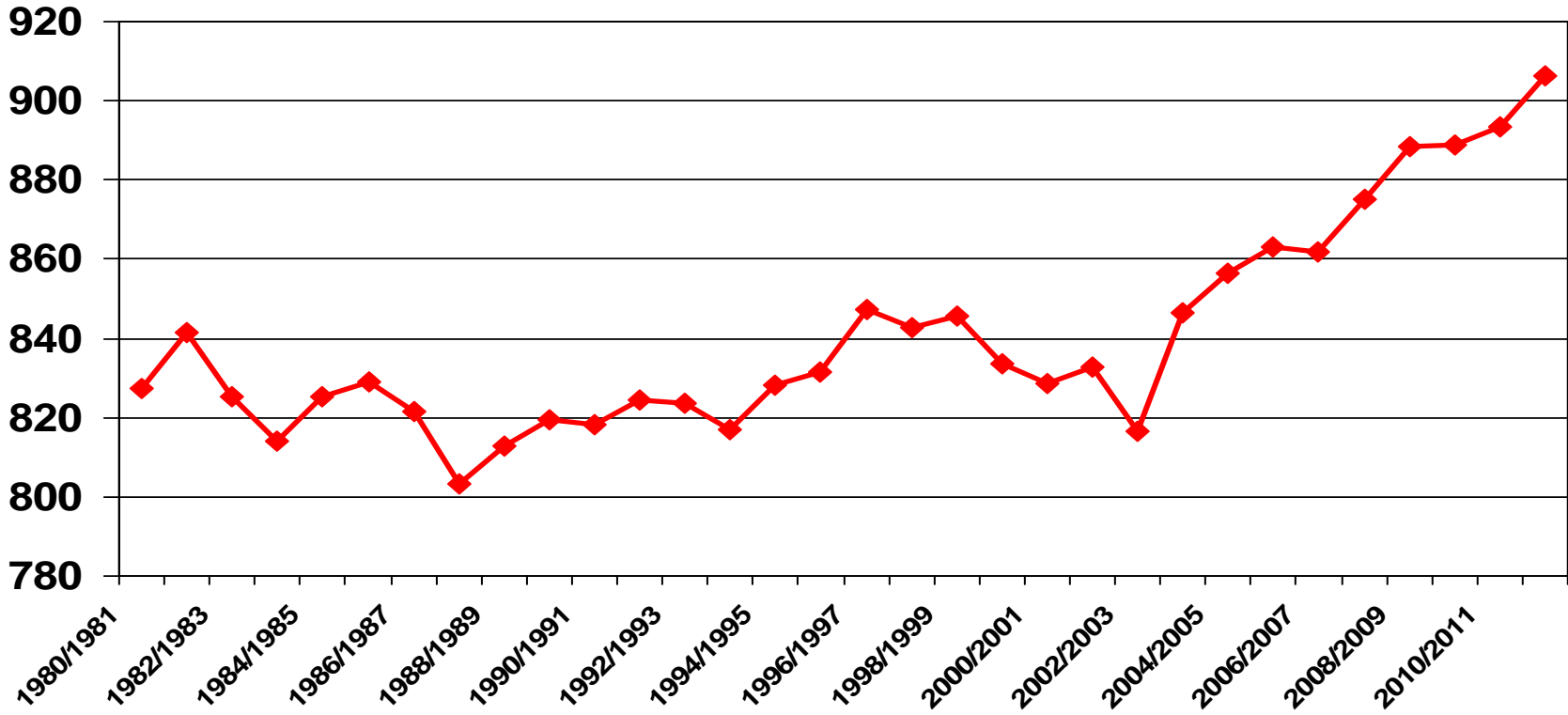
million hectares

	Area 1990	Area 2000	Area 2011	Chg 90-00	Chg 00-11
Sub-Saharan Africa	37.5	48.9	66.6	11.4	17.7
Brazil	35.8	36.5	52.5	0.7	16.0
Former USSR	55.1	49.2	62.2	-5.9	13.0
India	82.1	93.4	105.6	11.3	12.2
United States	93.6	100.5	112.7	7.0	12.1
China	98.8	93.5	103.4	-5.3	9.8
Argentina	18.7	27.8	35.5	9.1	7.7
Total	613.7	639.9	725.2	26.2	85.3

For Corn, Wheat, Soybeans, Rape, Rice and Cotton

World Major Crop Area

million hectares

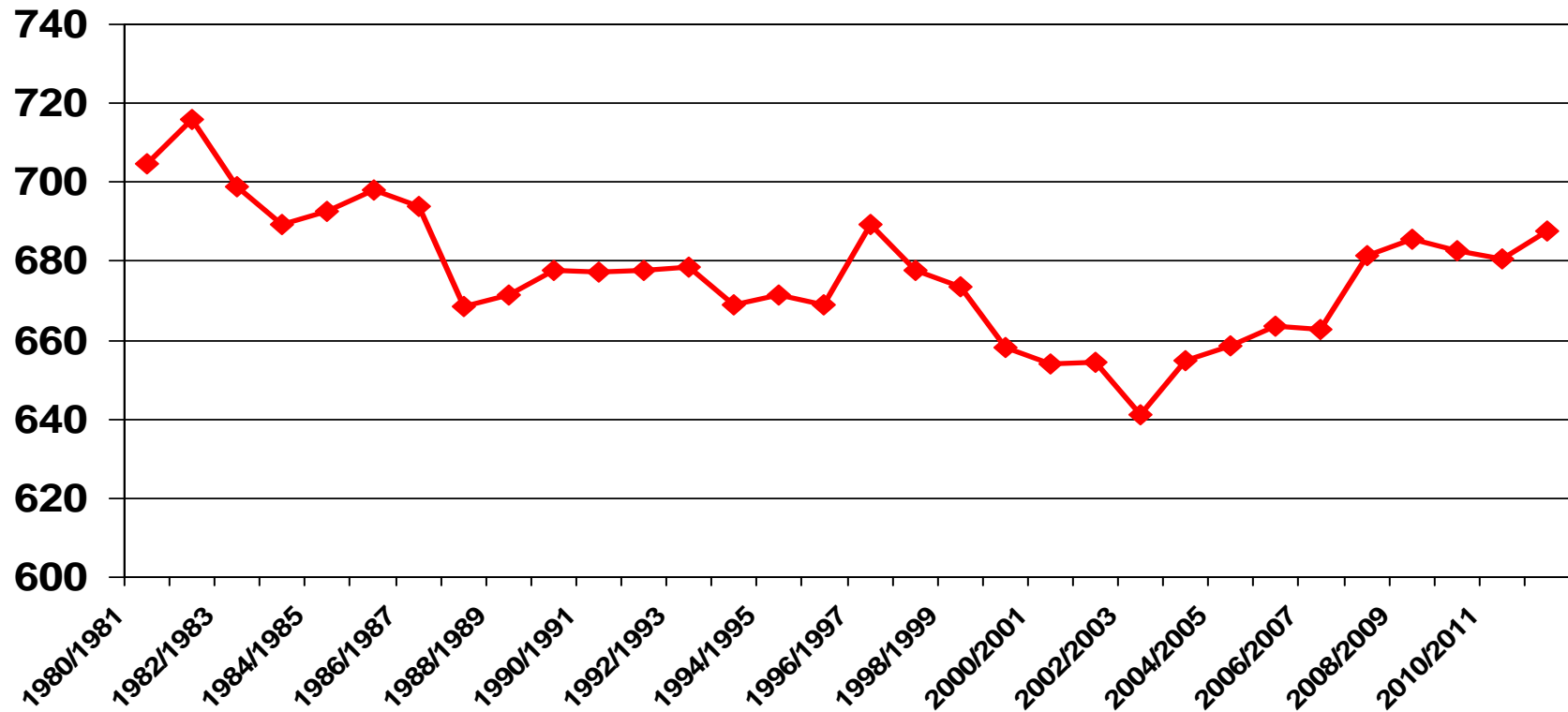


About a 10% increase since 2000 - 75 million hectares



World Grains Area

million hectares



Changes in Grain Area

million hectares

	Area 1990	Area 2000	Area 2011	Chg 90-00	Chg 00-11
Corn	129.2	137.3	164.4	8.1	31.1
Rice	147.0	152.4	160.3	5.5	7.8
Wheat	231.7	218.0	222.6	-13.7	4.6
Barley	73.0	53.9	50.6	-19.1	-3.2
Others	96.6	92.2	85.7	-4.4	-6.7
Total	677.5	653.8	687.7	-23.6	33.8

Changes in Corn Area

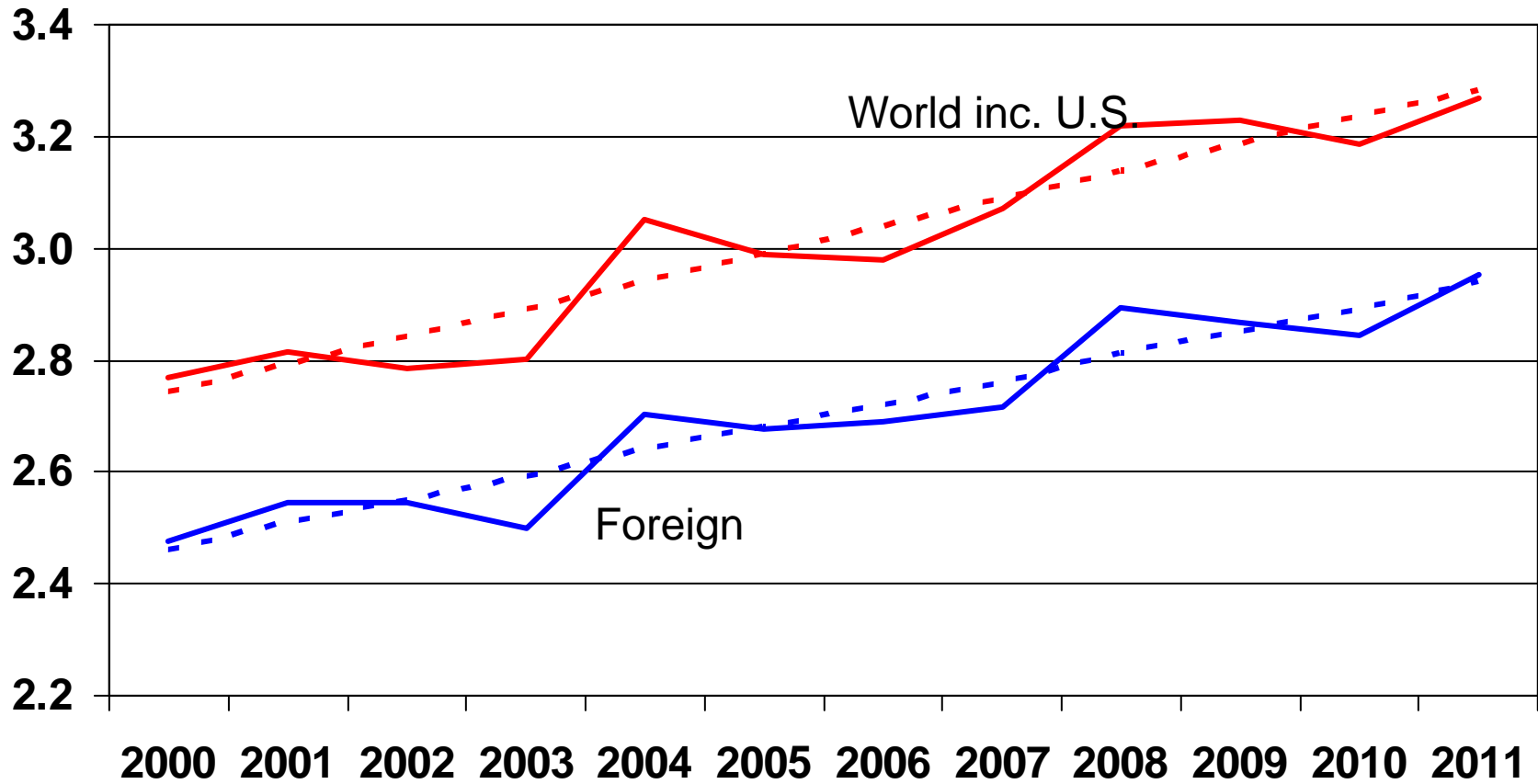
million hectares

	Area 1990	Area 2000	Area 2011	Chg 90-00	Chg 00-11
China	21.4	23.1	33.0	1.7	9.9
United States	27.1	29.3	34.2	2.2	4.8
Ukraine	1.2	1.3	3.5	0.1	2.2
India	5.9	6.6	8.5	0.7	1.9
Nigeria ←	3.0	3.2	4.9	0.2	1.7
Brazil	13.5	13.0	14.5	-0.5	1.5
Tanzania ←	1.6	2.0	3.1	0.4	1.1
total	129.2	137.3	168.4	8.1	31.1

Almost 40% of the increase is in India and China

Grain Yields

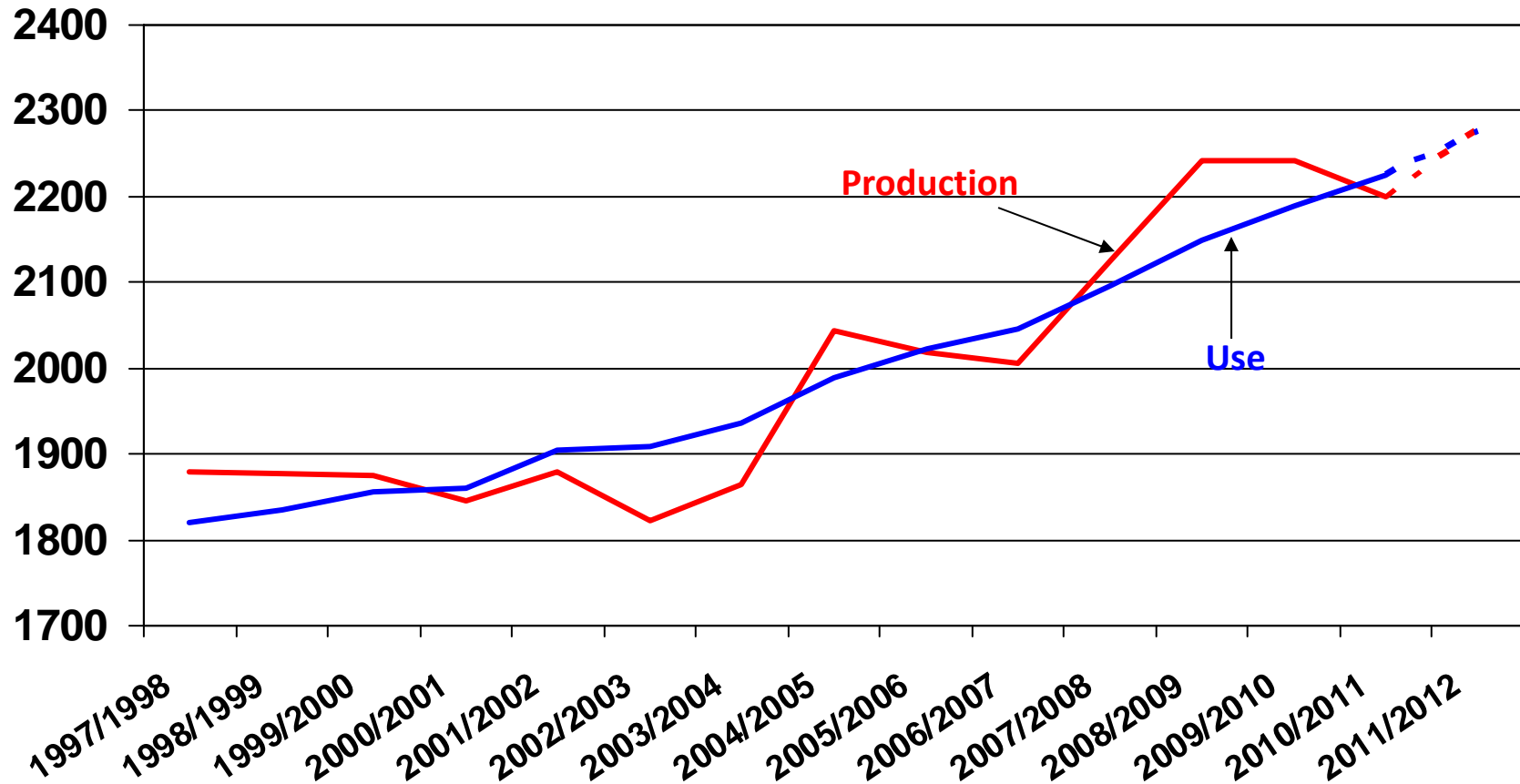
tonnes per hectare



In 2010 Yields were down ~1.5% from trend

World Grain Production and Use

million tonnes

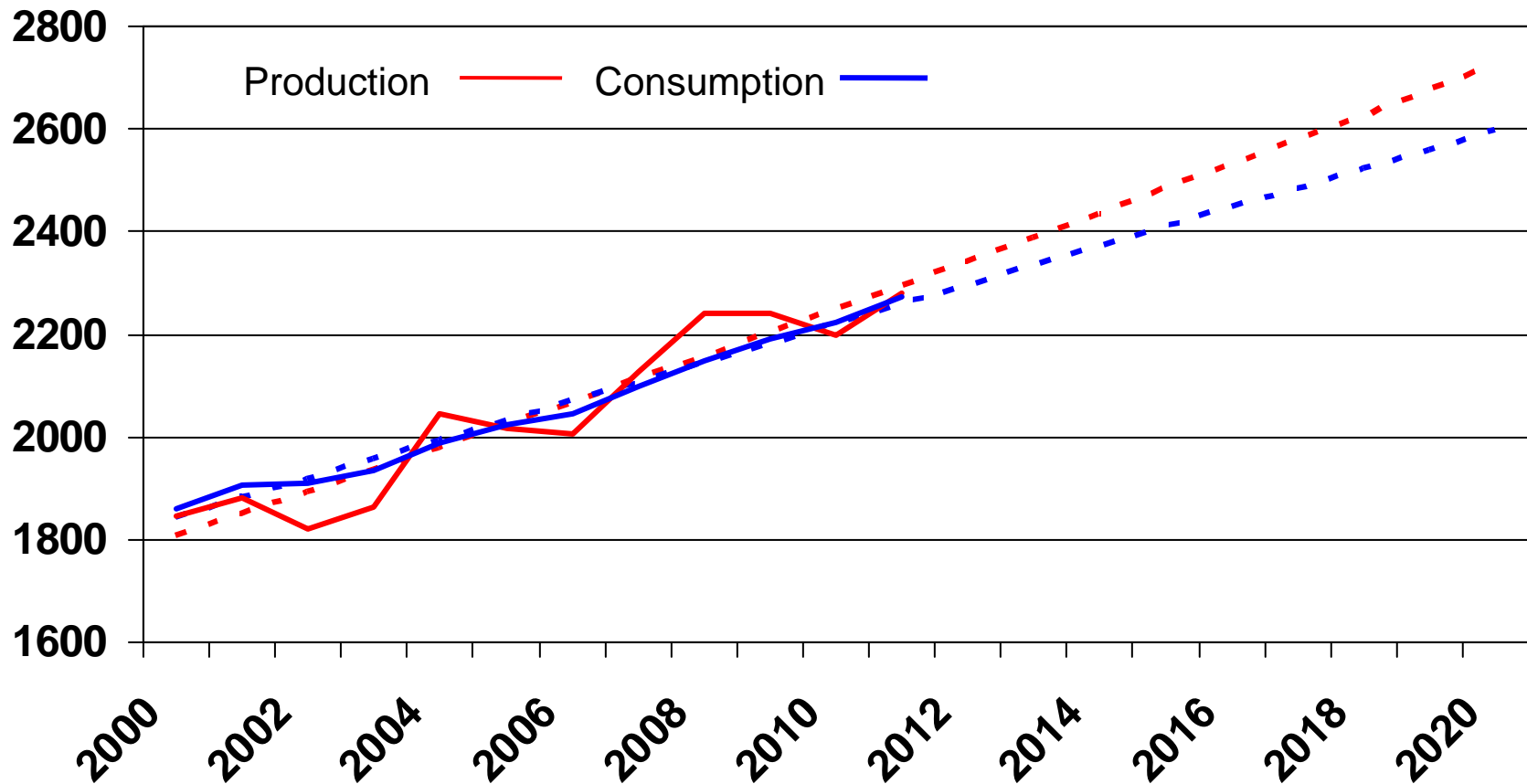


For 2000 through 2006 – deficit of 190 million tonnes
For 2007 through 2009 – surplus of 171 million tonnes
Deficit for 2010-11 - deficit of 24 million tonnes



World Grain Production & Use

million tonnes



**But there is Strong Demand Growth for Some
Ag Products**

Consumption Increases

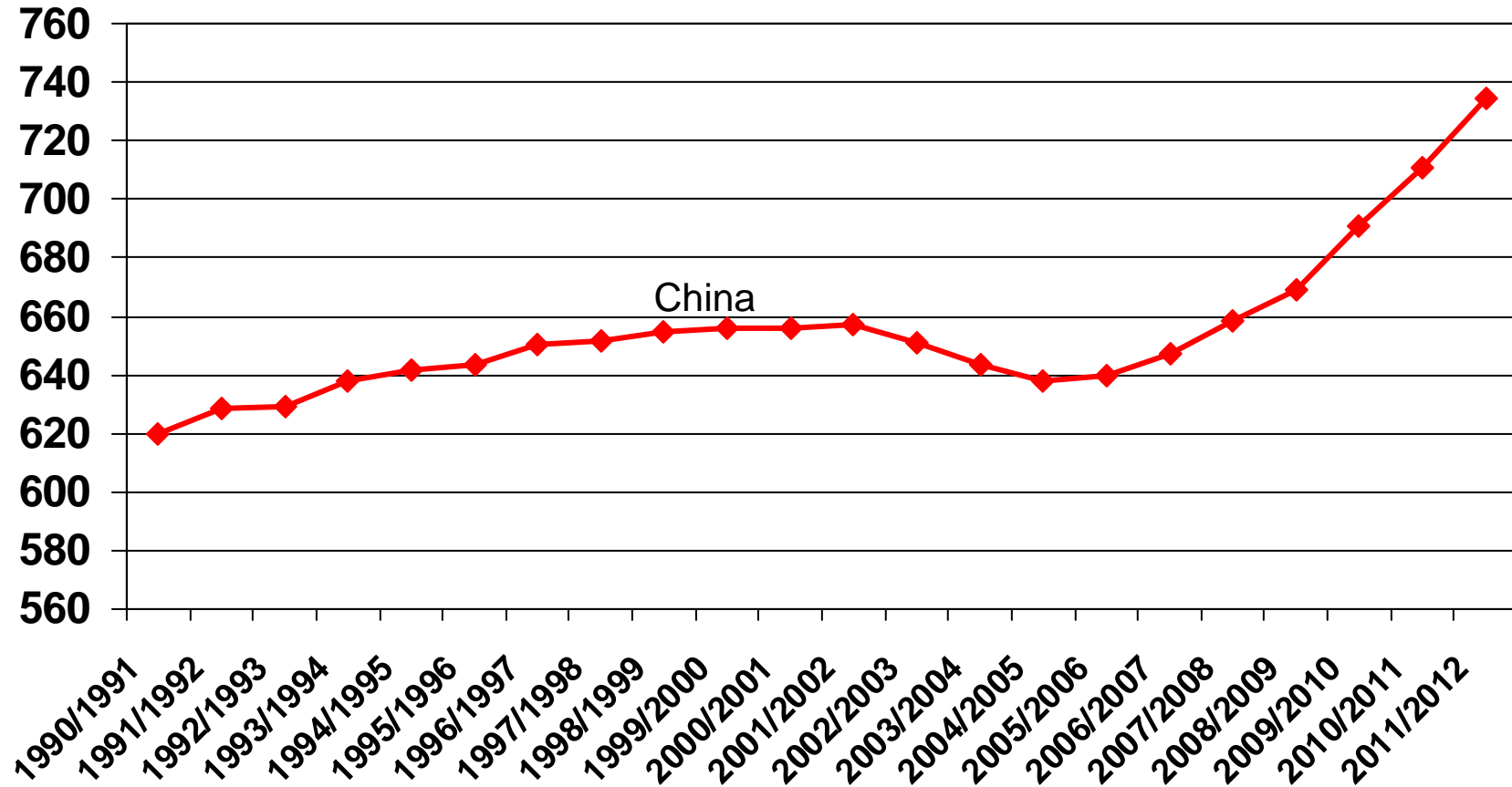
percent change 2000 to 2011

	U.S.	Foreign	
Corn	42	42	
Soybeans	-3	75	
Wheat	-11	17	
Rice	10	16	
Broilers	21	55	
Cotton	-55	34	
Pork	-1	22	

Demand Growth in China, India and Elsewhere

Per Capita Grain Consumption

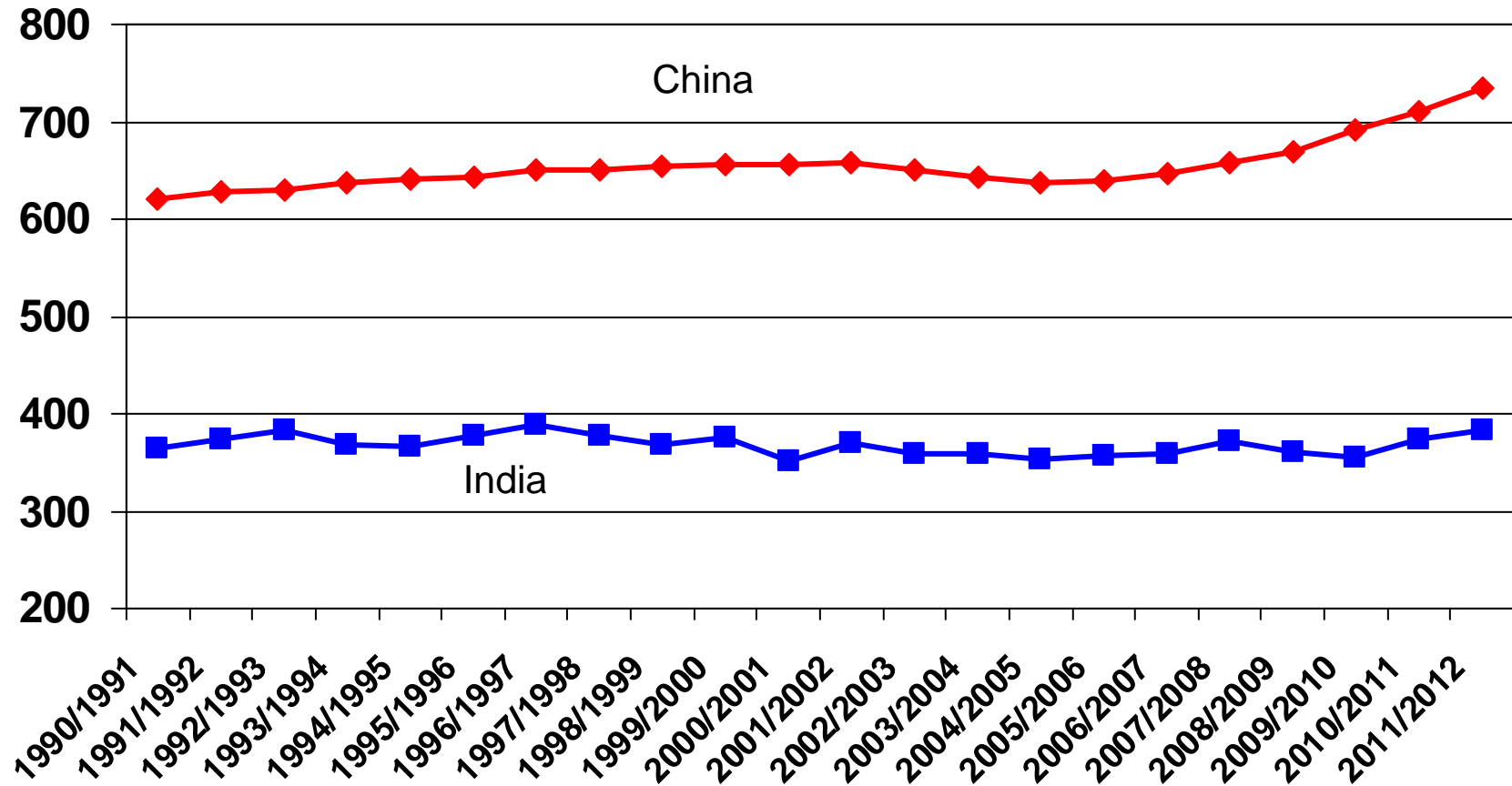
pounds



This looks impressive – but the increase is only 12% since 2000
But 80 pounds per person for > 1.3 billion people is a lot of grain! (48 mmt)

Per Capita Grain Consumption

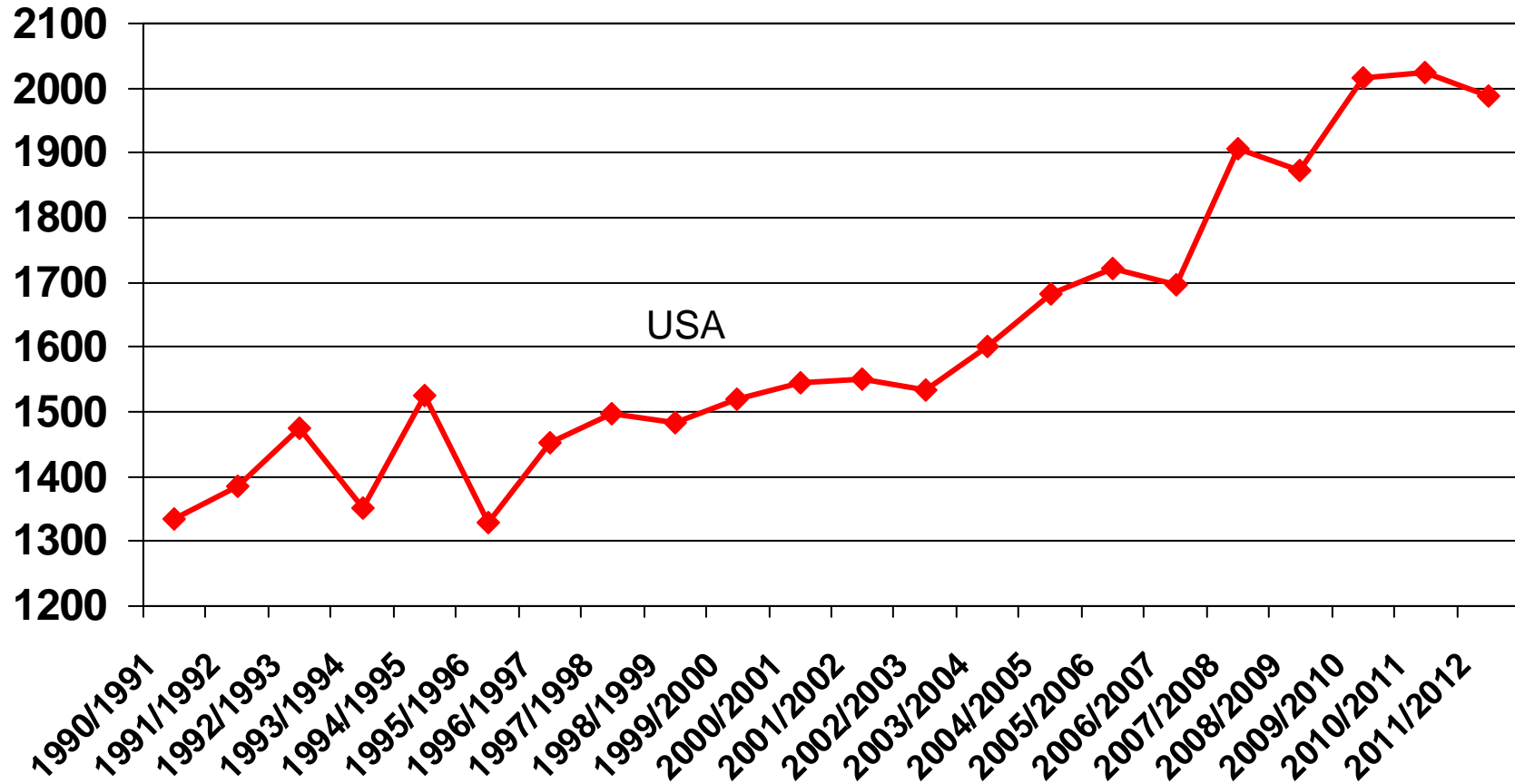
pounds



There are few signs of real demand growth for India

Per Capita Grain Consumption

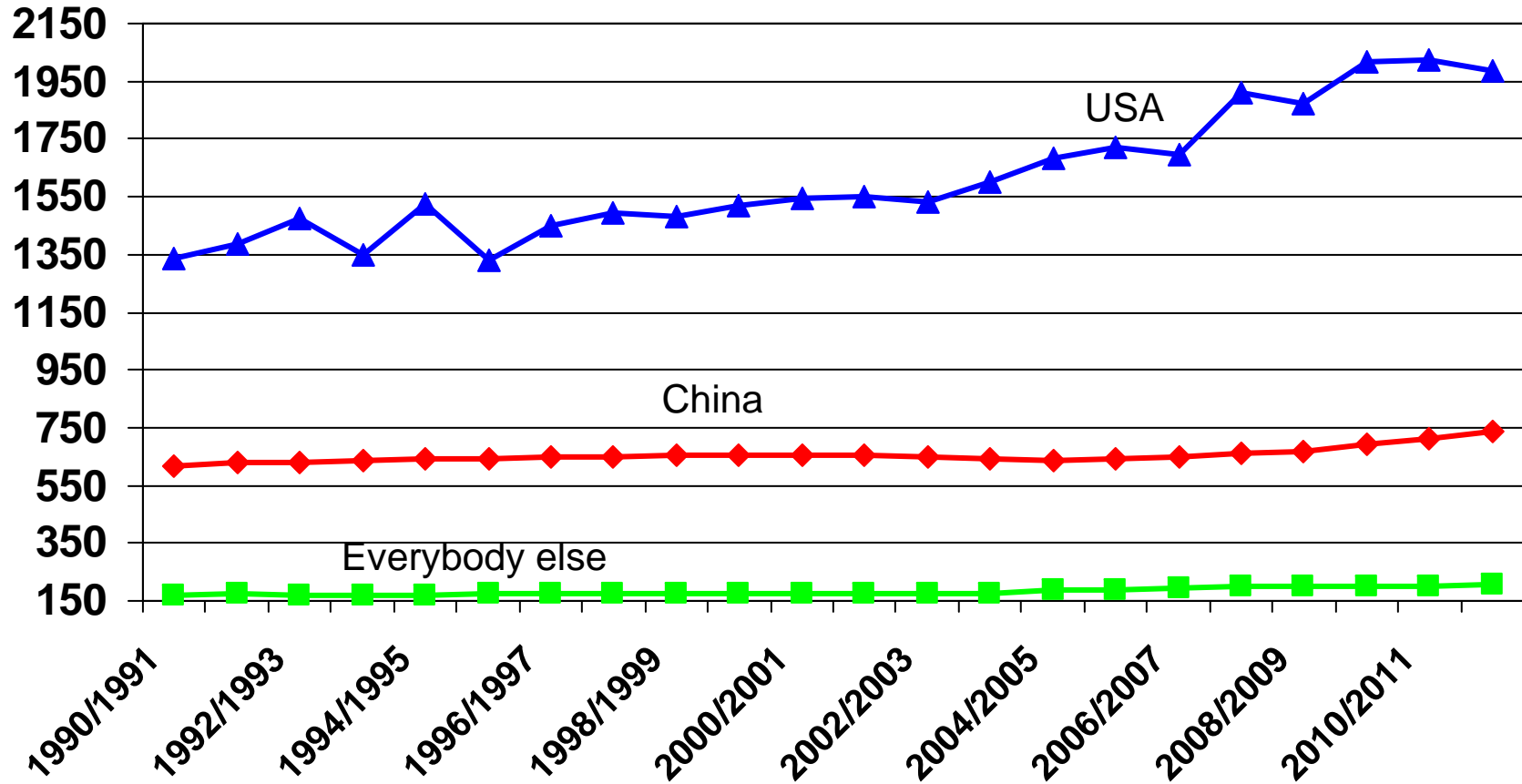
pounds



The gain here totals 65 mmt!

Per Capita Grain Consumption

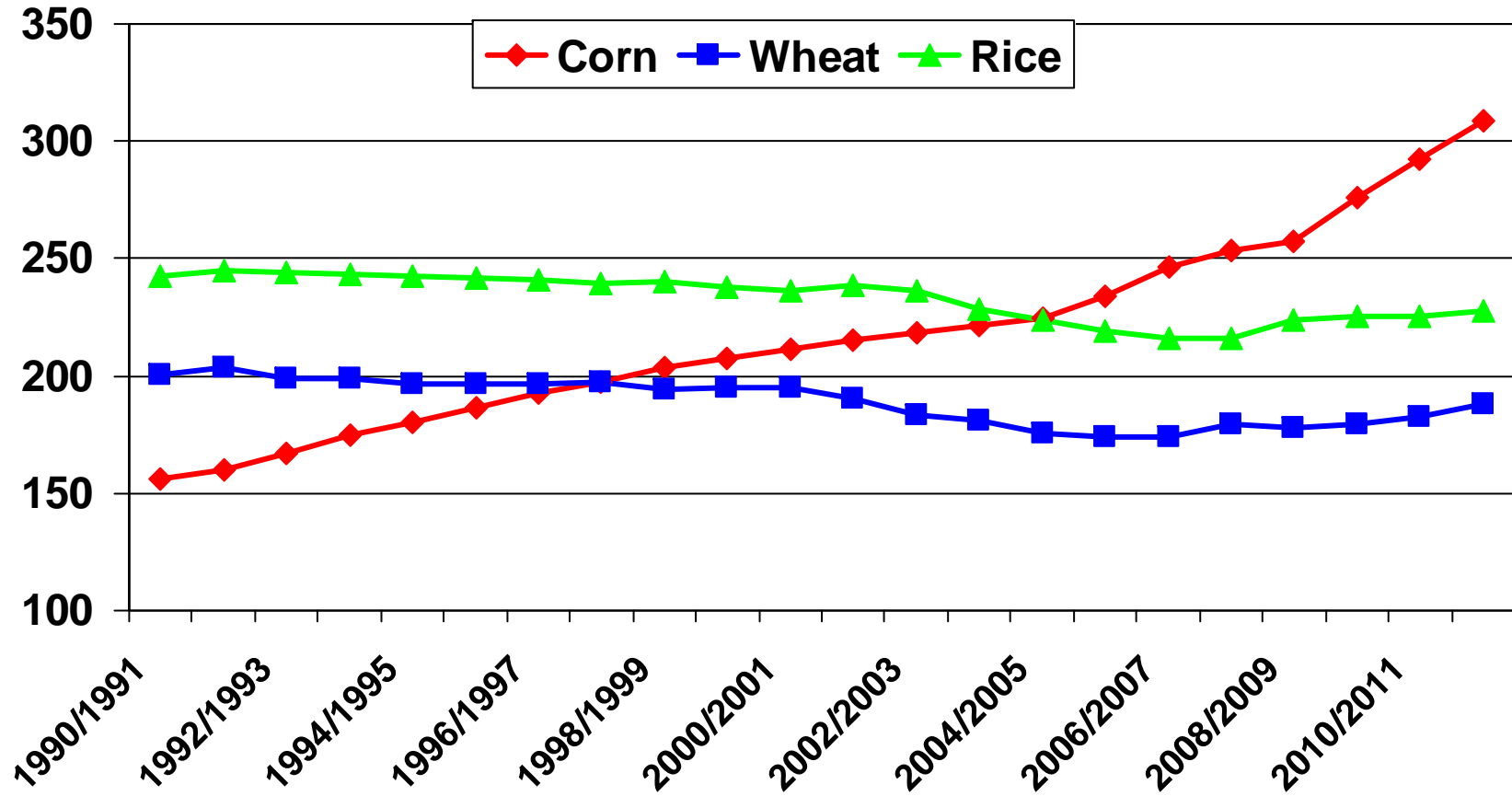
pounds



But the changes to everybody else (times 4 billion people) is 50 mmt

China's Per Capita Grain Consumption

pounds



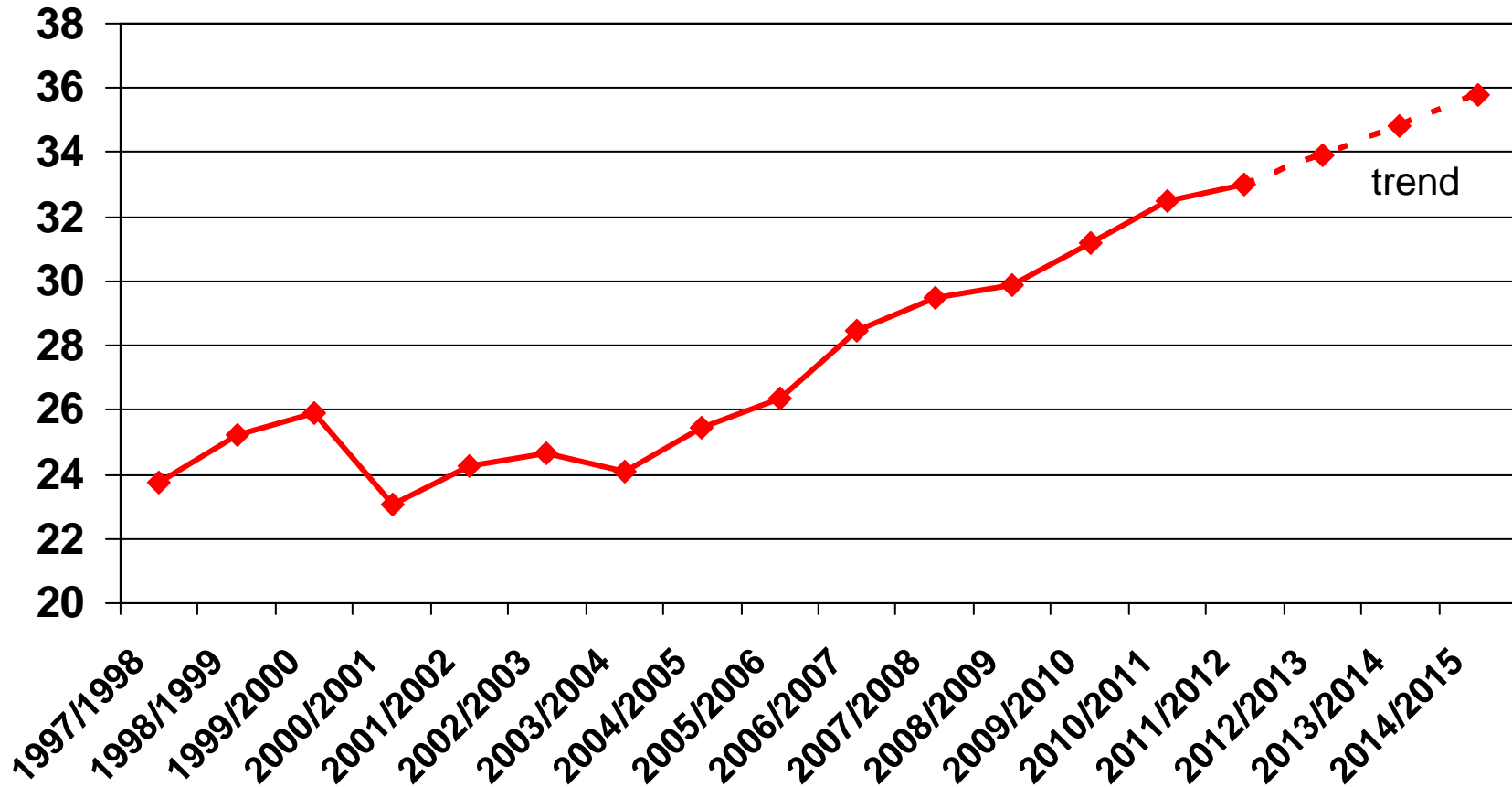
Since 2000 - corn +46%, wheat -4%, rice -4%

China's Corn Sector Outlook

- Demand growth is strong
 - Rising at 3.4% per year (trend since 2000)
 - Rising at 4.6% per year (trend since 2005)
- Solid yield gains
 - Rising at a 1.5% annual rate
- But the key to the outlook is area
 - up 47% since 2000

China's Corn Acreage

million hectares



Area is rising at a rate of about 3% per year ~ 1 million hectares

China's Corn Surplus or Deficit in 2015

million tonnes



No Area Increase

Area Continues to Increase

Additional Corn Demand (million tonnes)

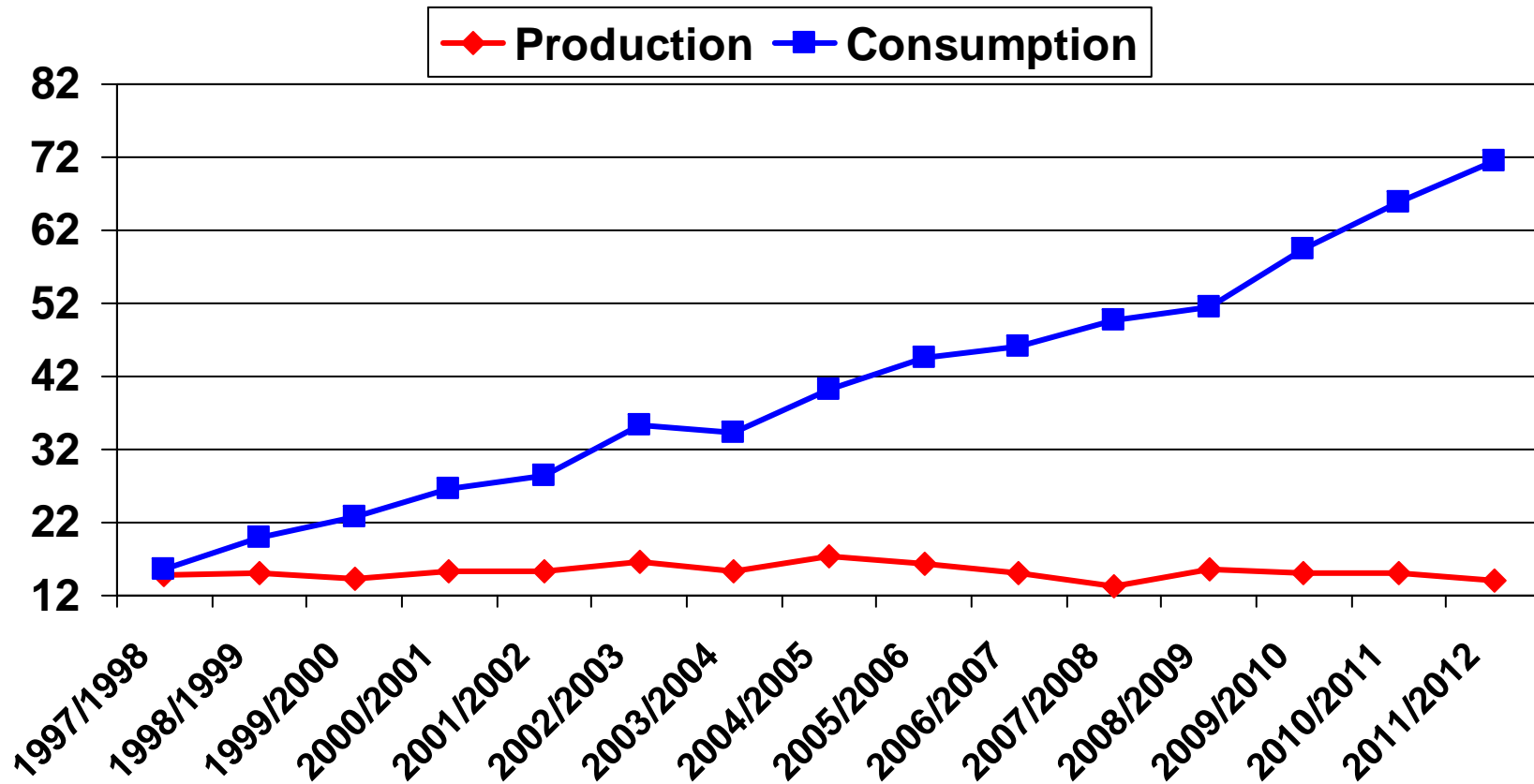
World Corn Demand rose 255 mmt since 2000



While we are on the Subject of China

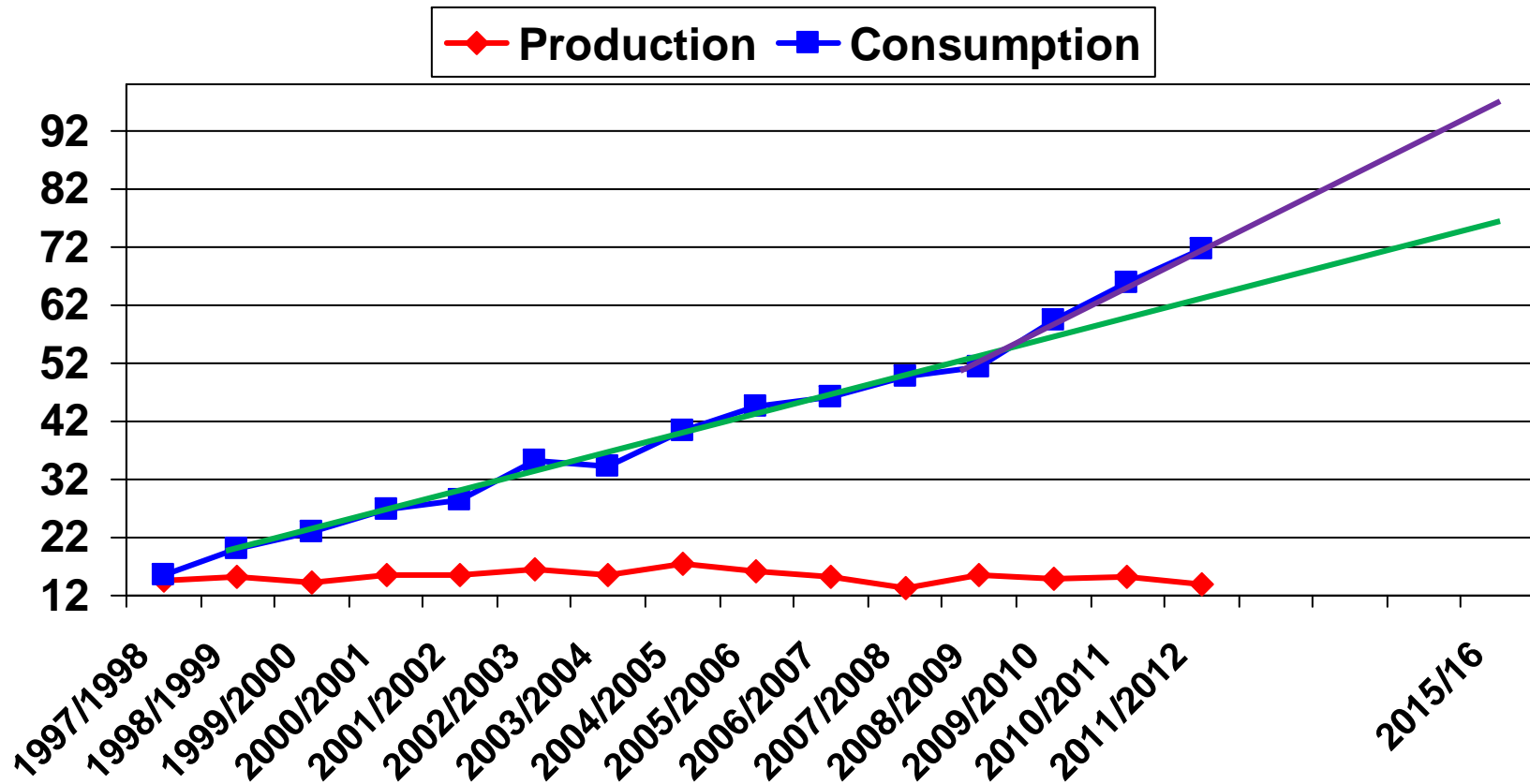
China's Soybean Balance

million tonnes



China's Soybean Balance

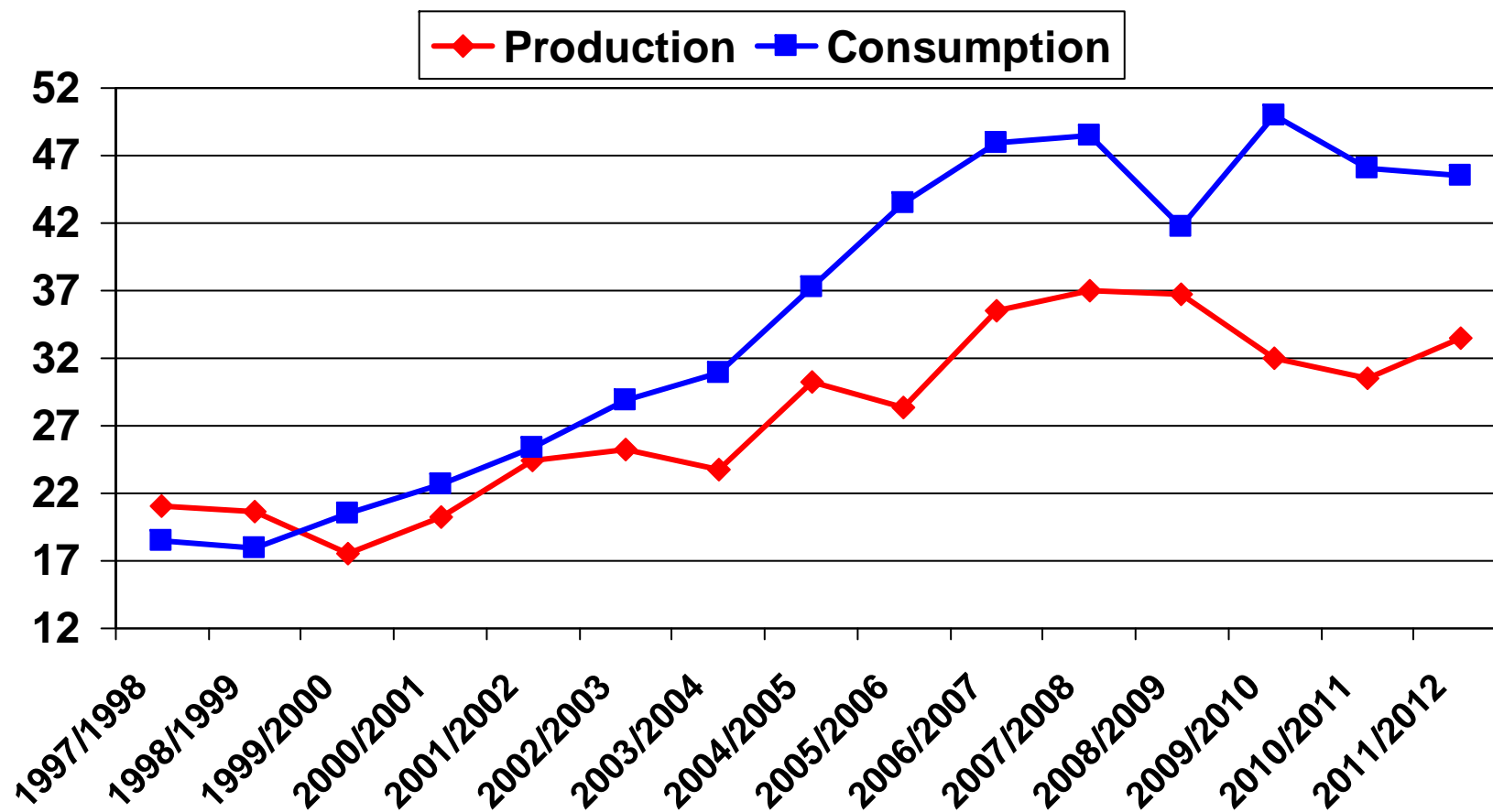
million tonnes



Deficit in 2015/16 is either 62 mmt – or 85 mmt
This year's deficit is about 58 mmt

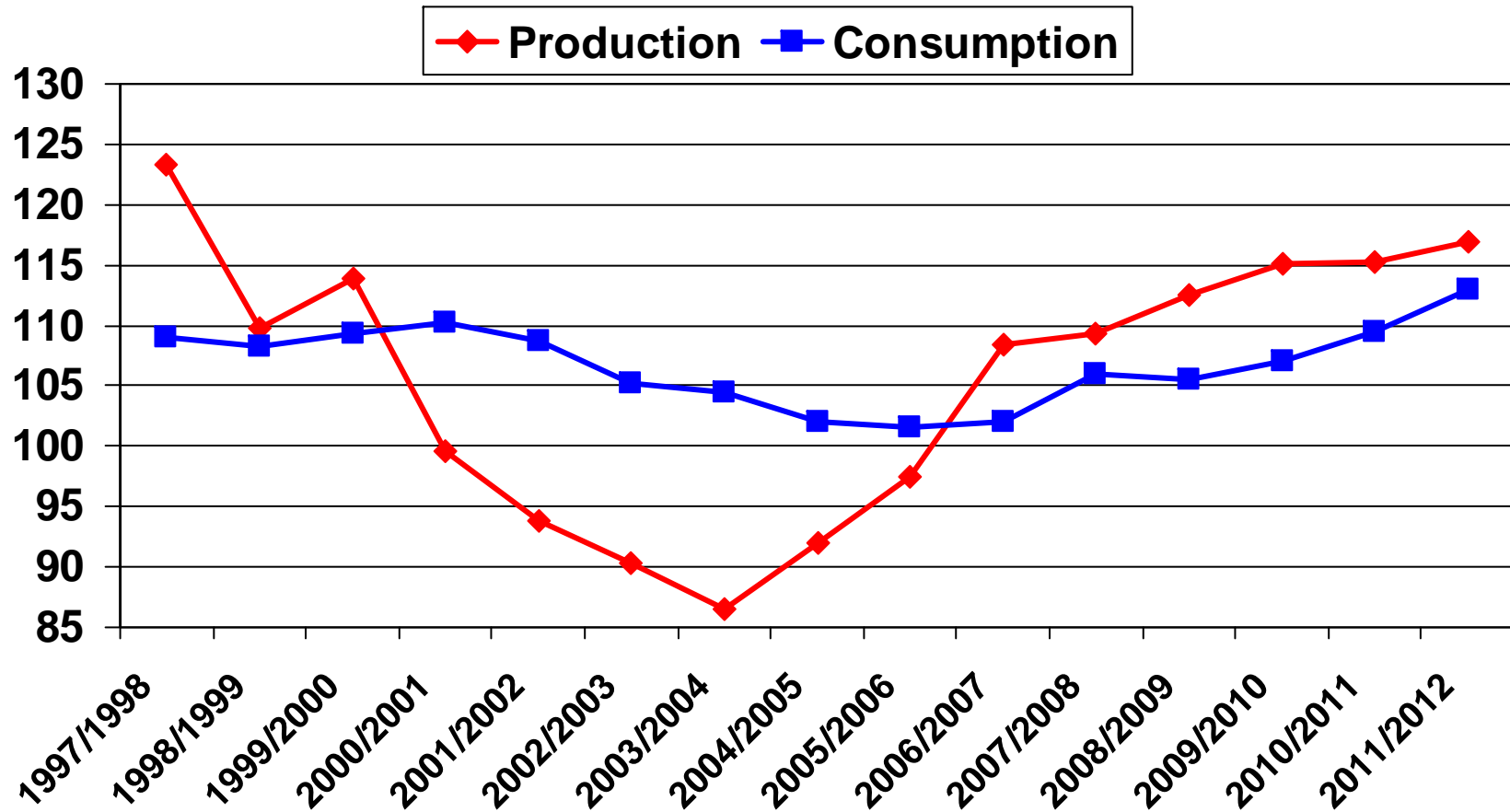
China's Cotton Balance

million bales



China's Wheat Balance

million tonnes

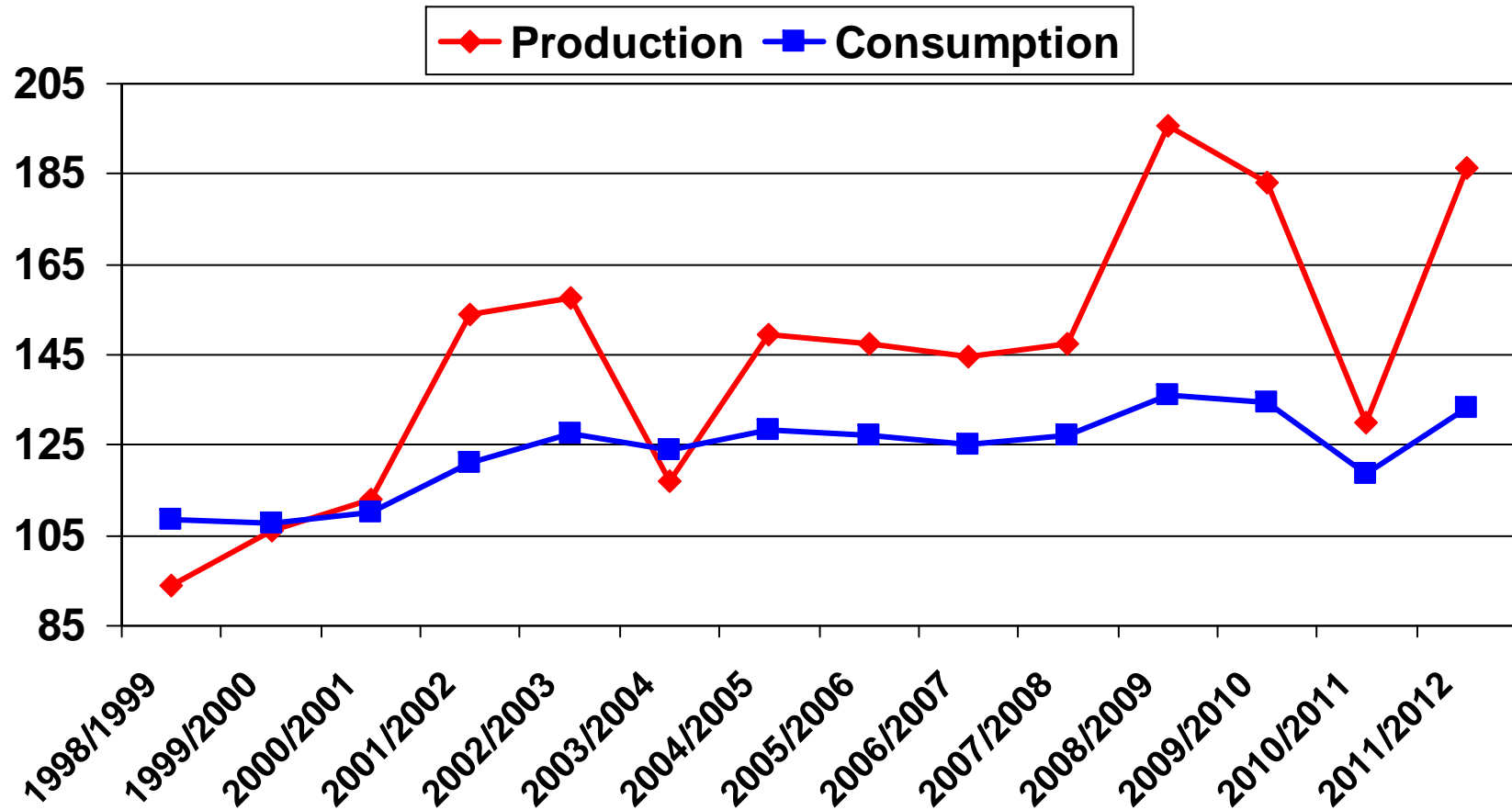


China has also been running a surplus of about 2 million tonnes of rice per year

The Resurgence of the FSU

FSU's Grain Balance

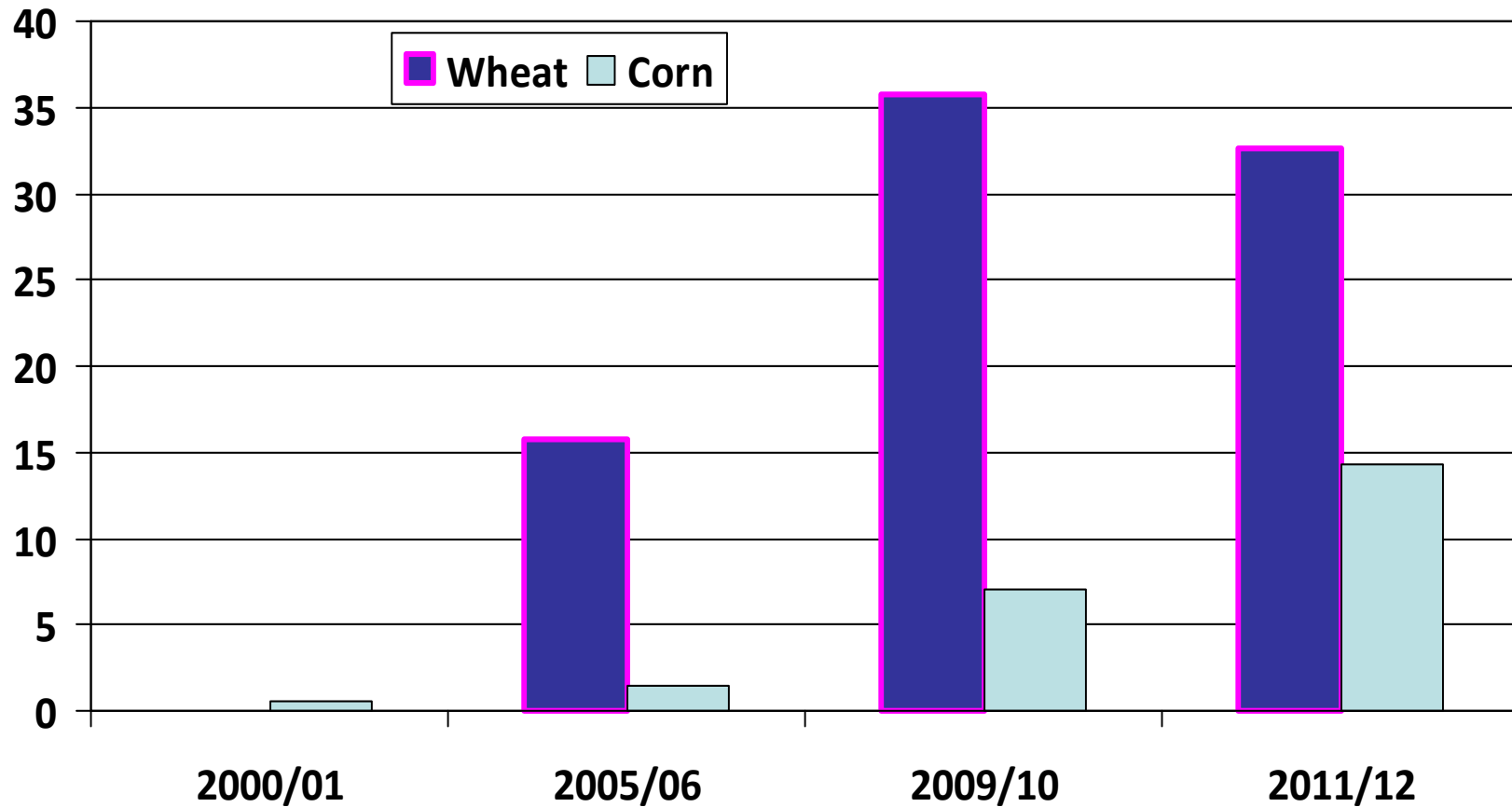
million tonnes



The surplus in recent years is about 50 million tonnes!

FSU Grain Surplus

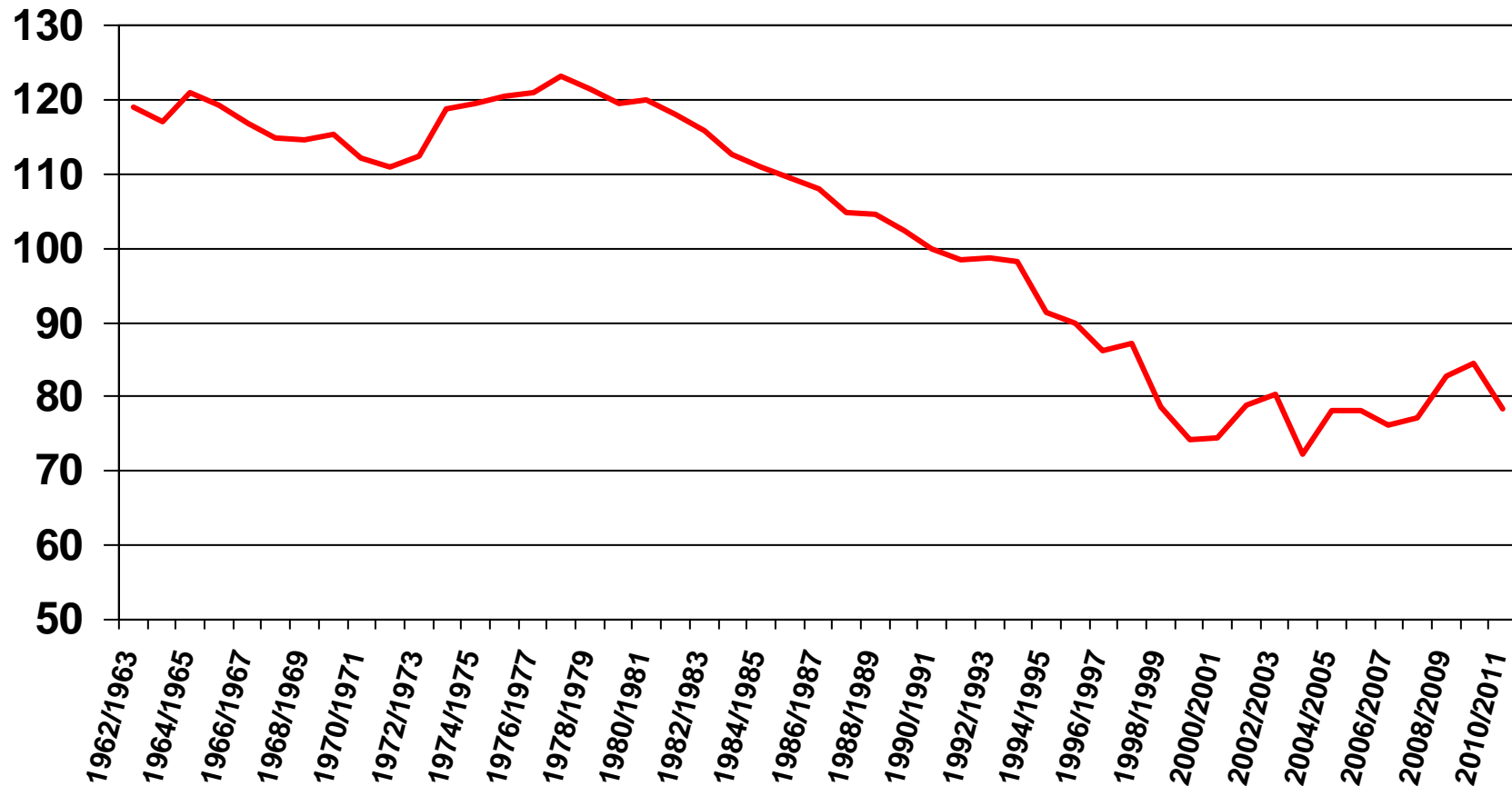
million tonnes



U.S. Wheat = 26 mmt - U.S. Corn = 40 mmt

Grain Area in the FSU-12

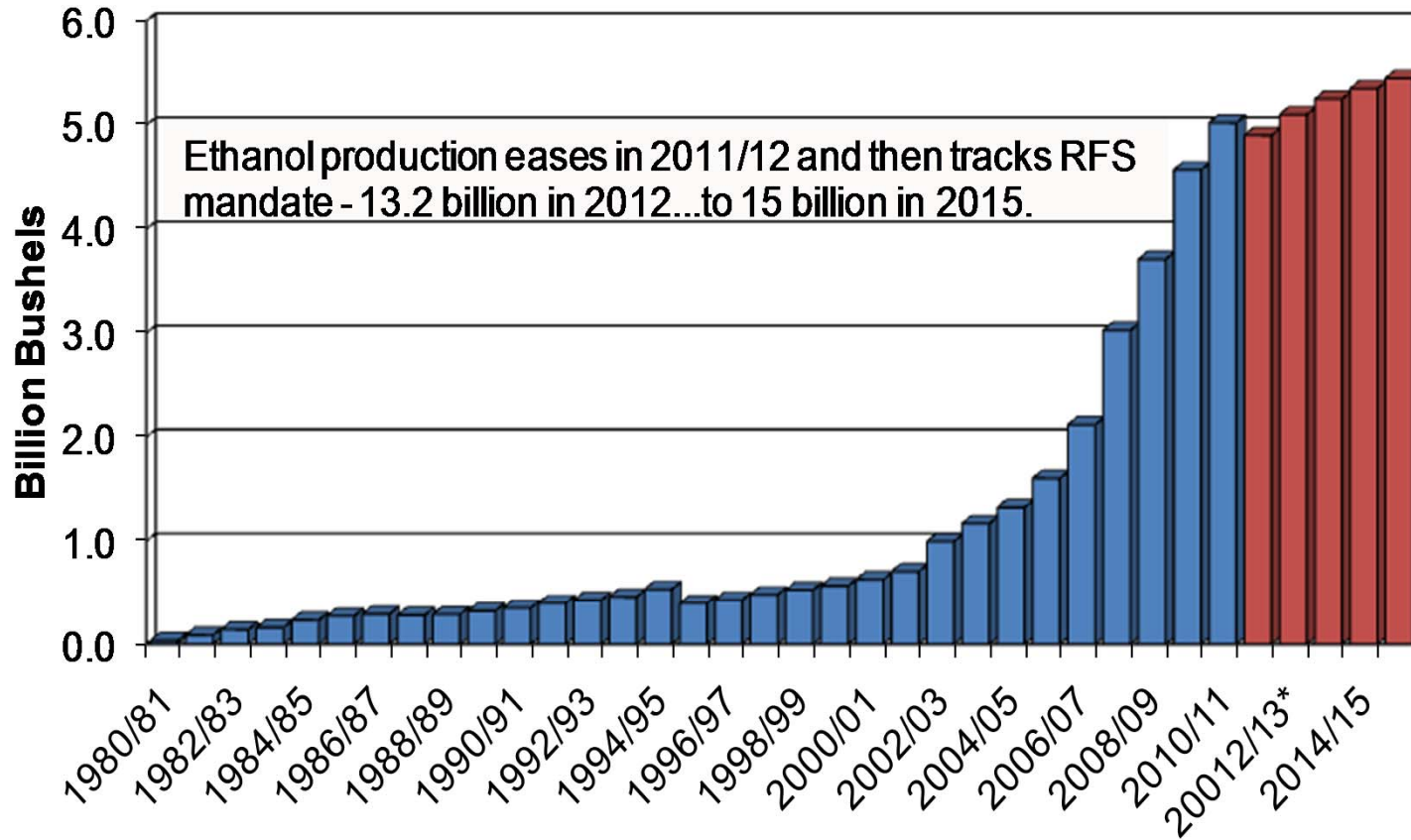
million hectares



A decline of almost 100 million acres since 1980

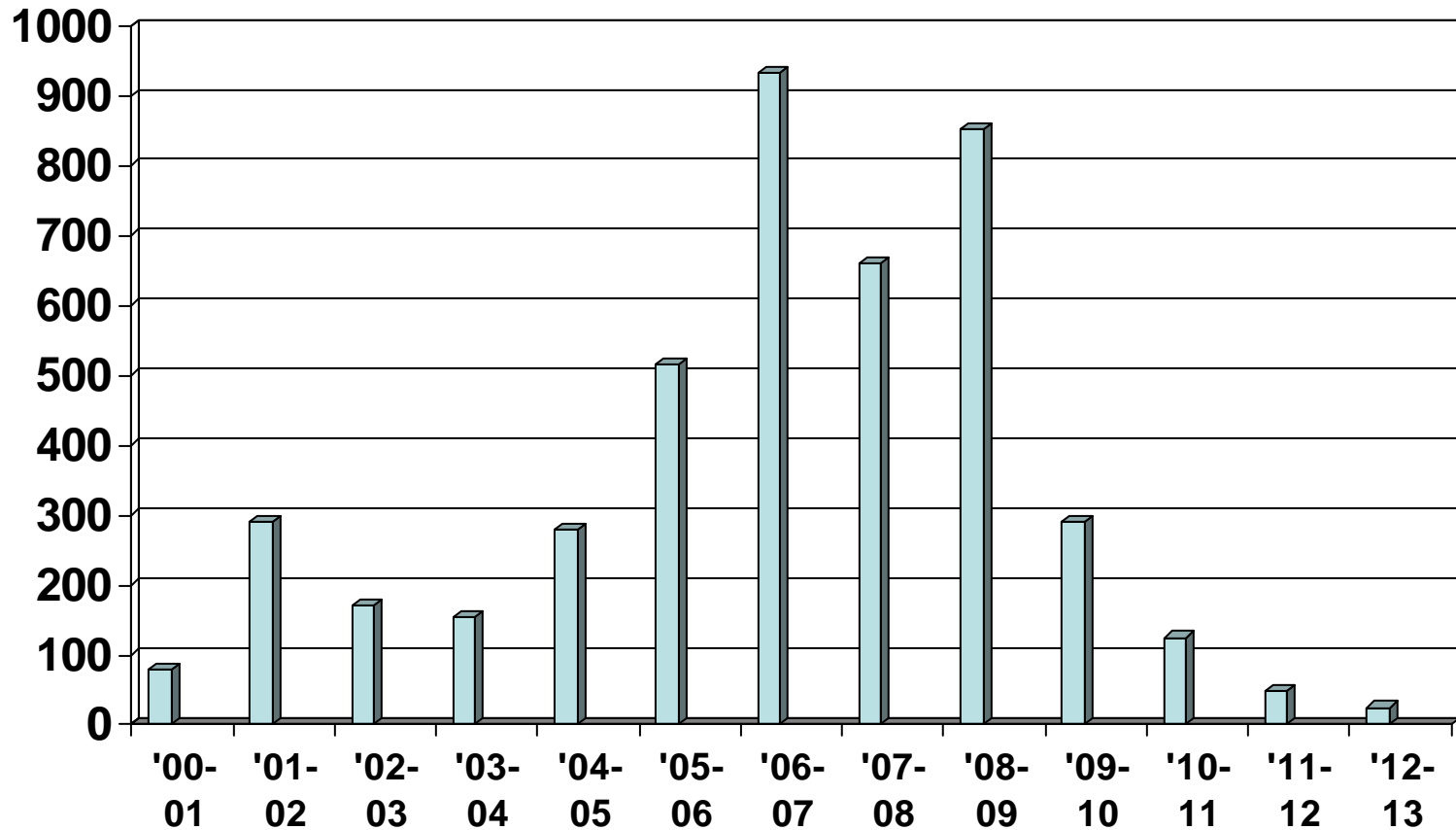
Some Trends for U.S. Agriculture

Corn Used for Ethanol Production



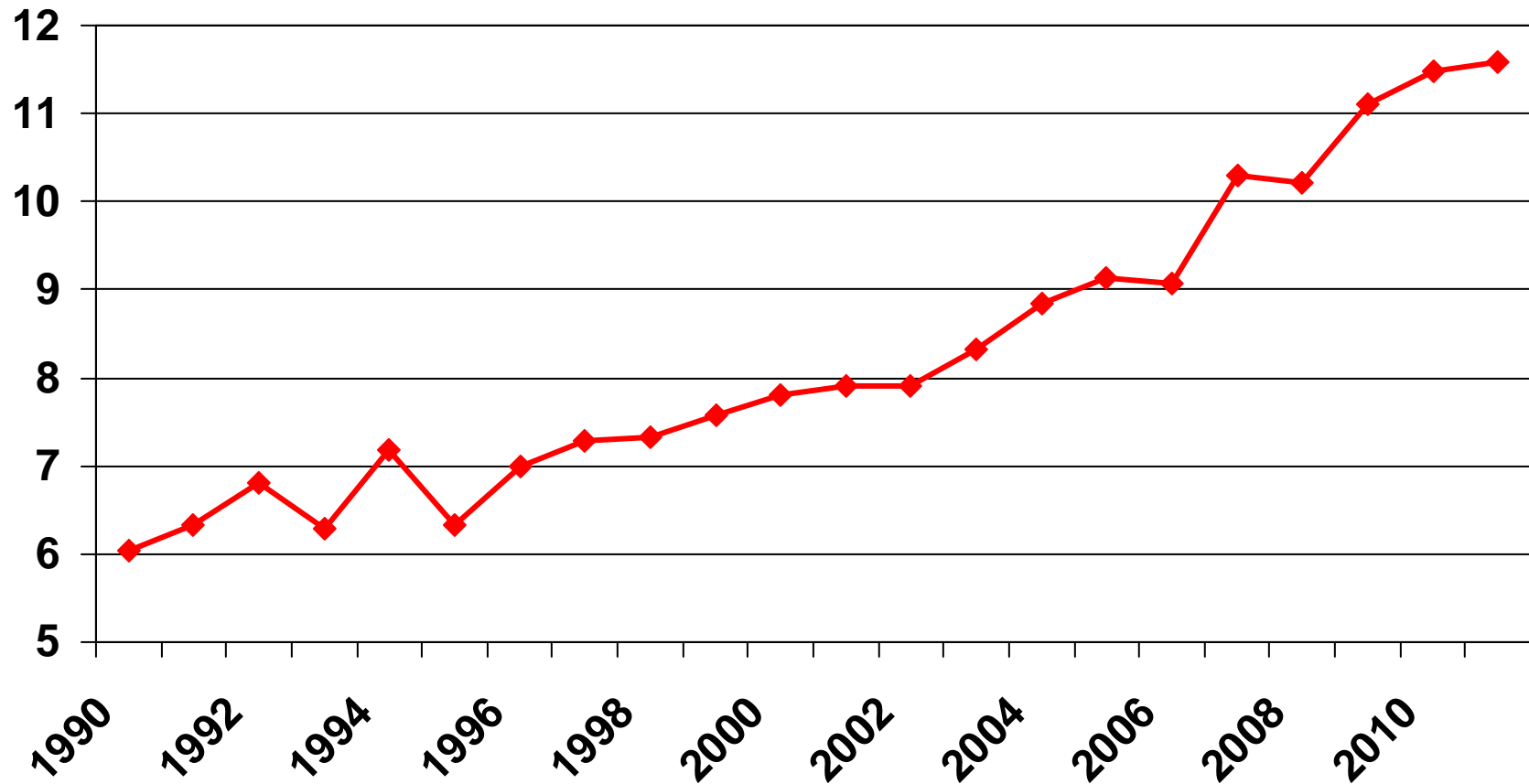
Change in Corn Ethanol Use

million bushels



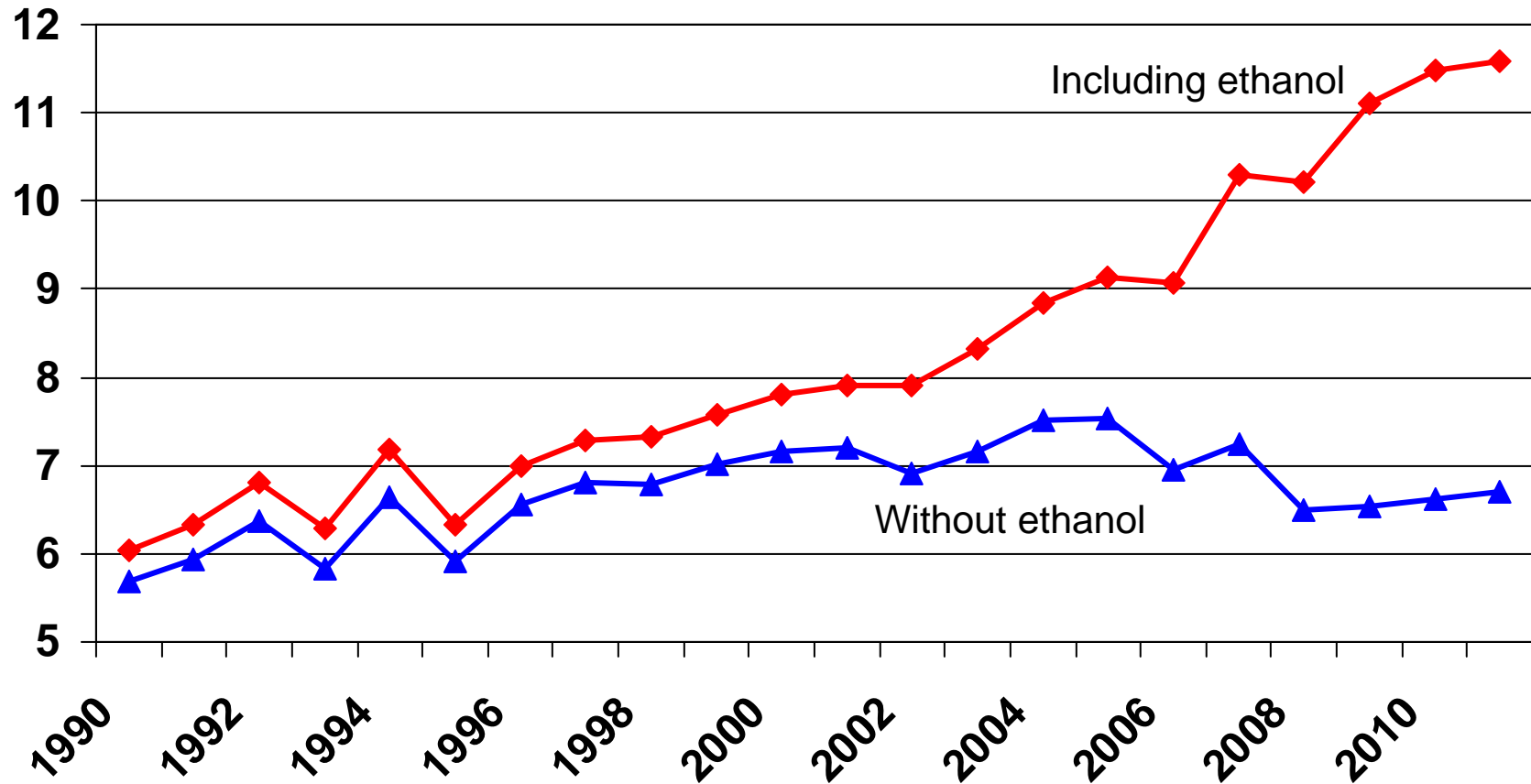
Domestic Corn Use

Billion Bushels



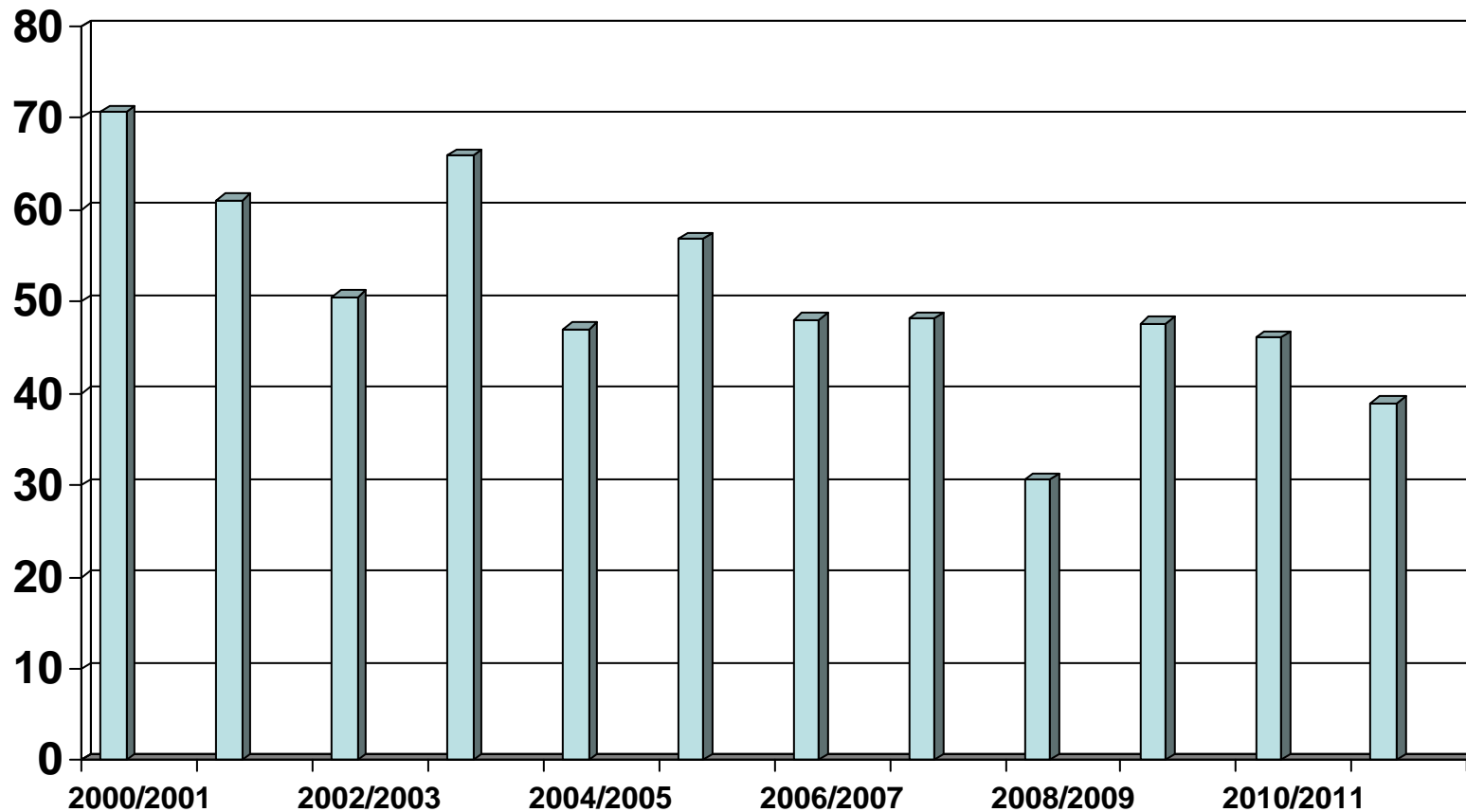
Domestic Corn Use

Billion Bushels



Foreign Corn Deficit

million tonnes

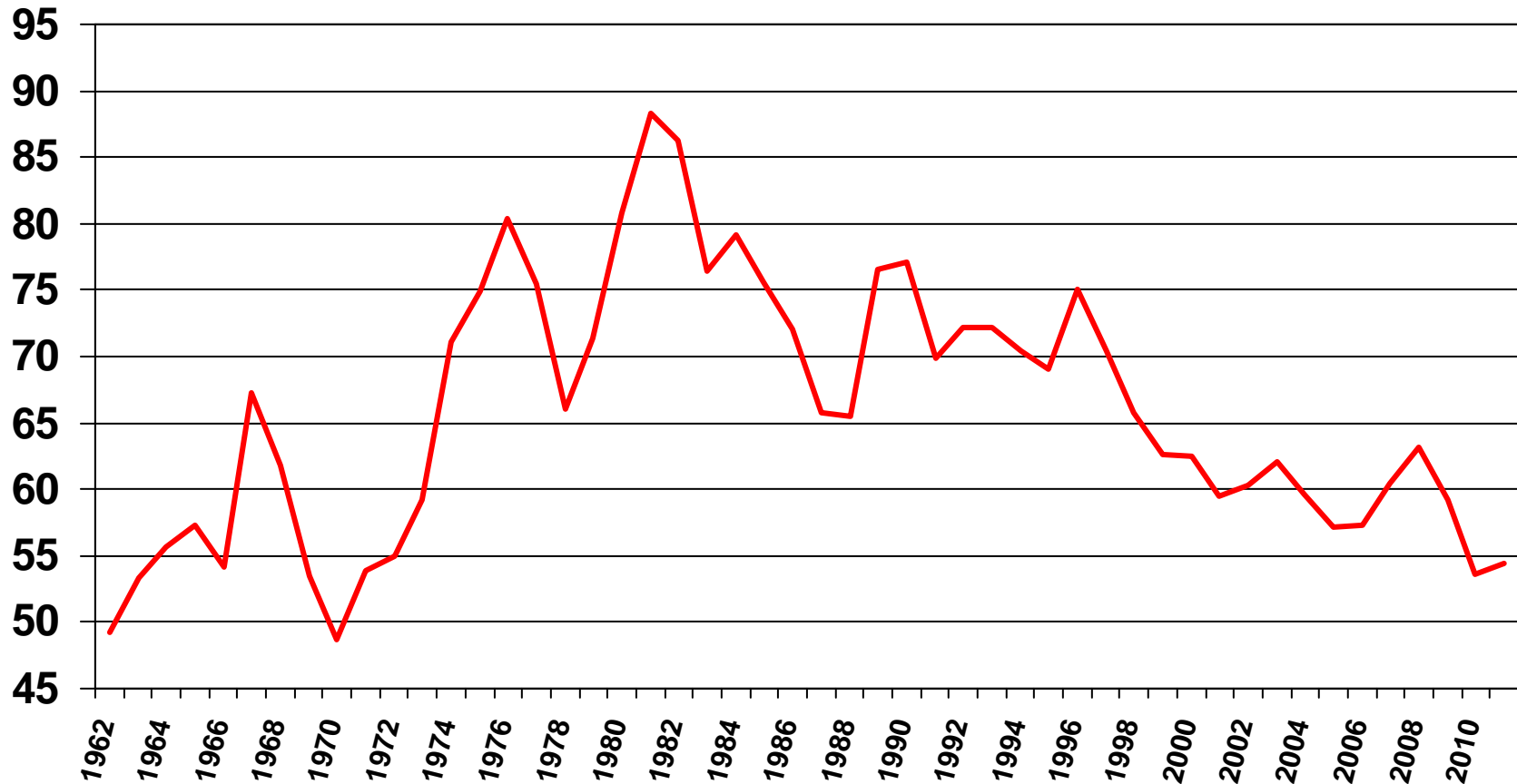


Faster Yield Growth Ahead

- Seed companies say they will double corn and soybean yields by 2030
 - Most of the gains come after 2015
 - That would put the corn yield around 300 bushels per acre
 - We would produce 25 billion bushels with current acreage
 - Demand will have to essentially double
- We will also be able to boost corn acreage
 - Drought tolerant corn expands area

U.S. Wheat Acreage

million acres



A decline of about 30 million acres since the early 1980s

So what is the point of all this?

- There seems to be no shortage of cropland
- Demand is rising – but the ethanol industry has played a major role in that
- Demand growth in China is the key – India not so much
- How much China can boost area is critical
- The FSU may be a major competitor
- The U.S. corn market needs to find a new source of demand growth
- If productivity roars higher – we could face oversupply

Questions??