

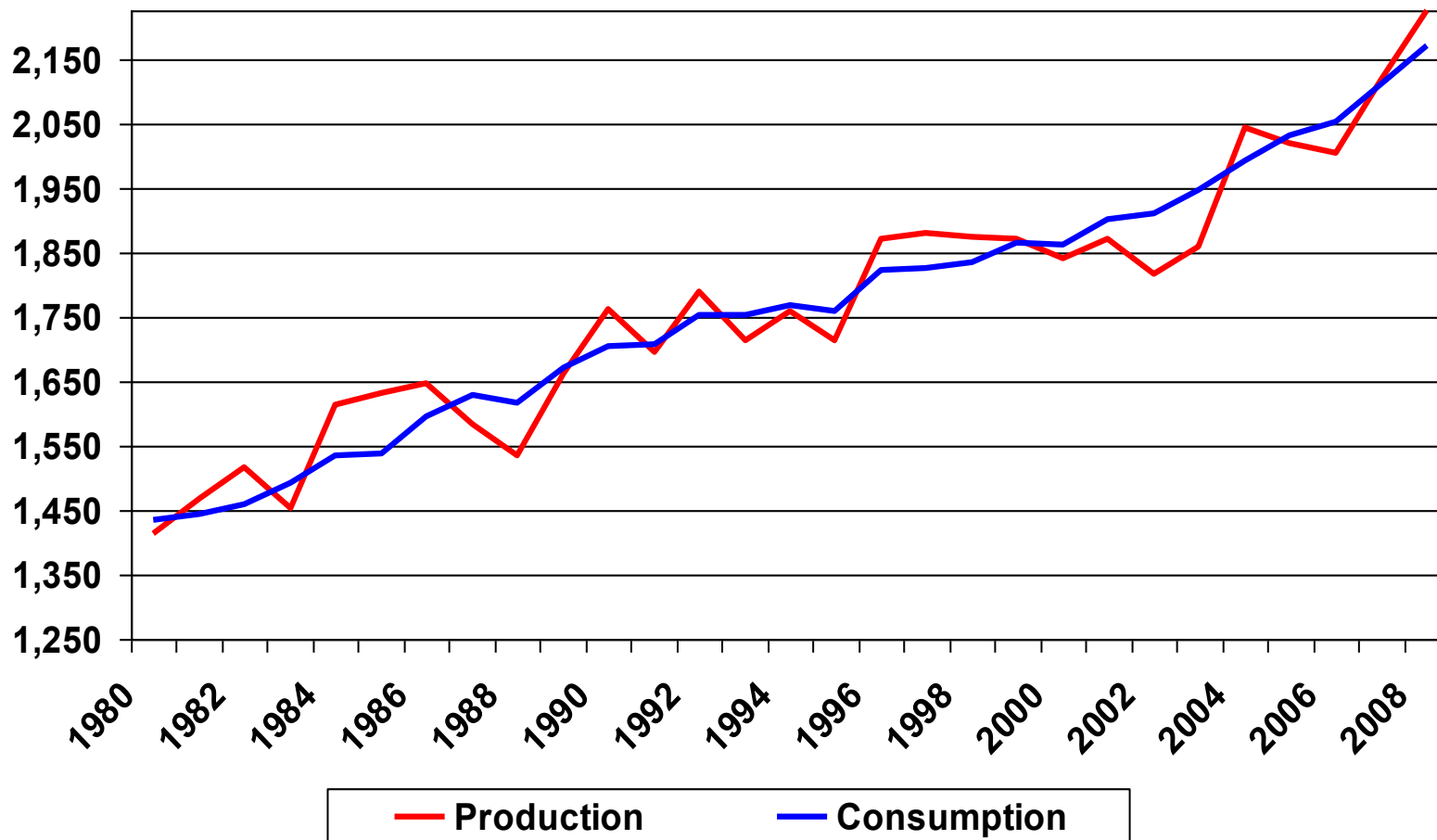
Trends for Global Agriculture



Rich Pottorff
Doane Advisory Services

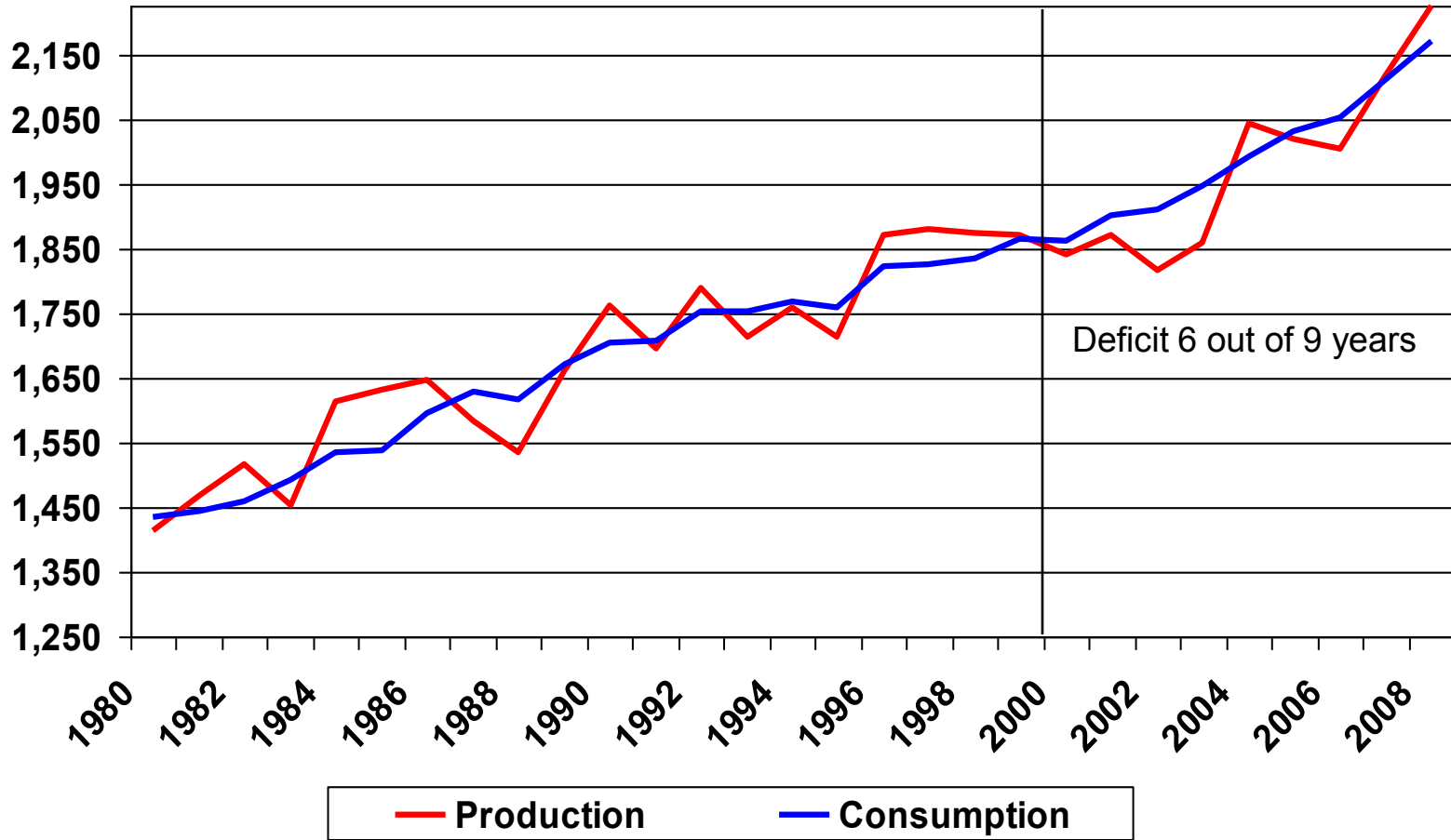
World Grain Production and Use

Million tonnes



World Grain Production and Use

Million tonnes

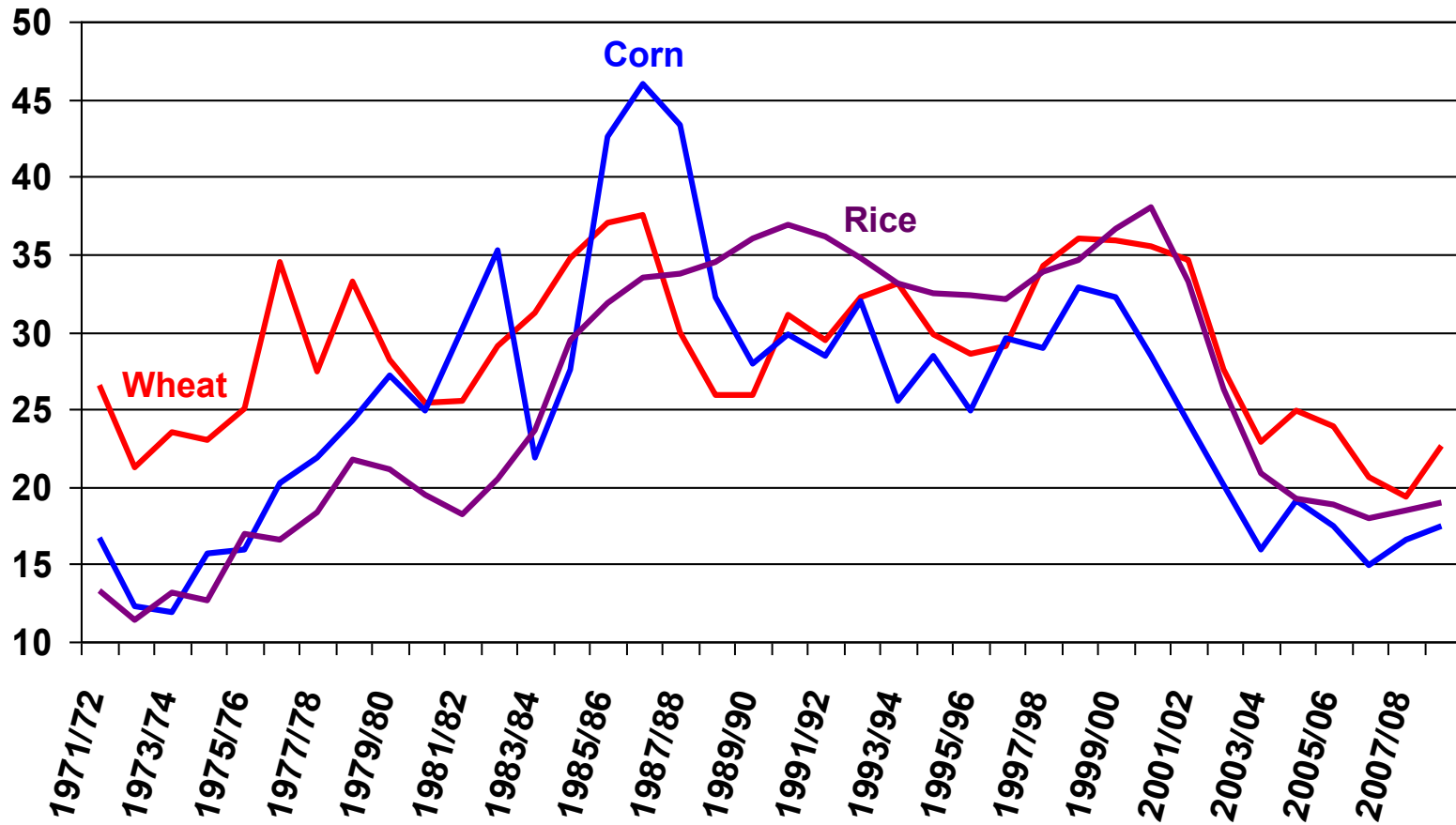


World Grain Balance

- World grain production is struggling to keep pace with consumption
 - Consumption has exceeded production in six out of the last nine years
 - The result has been a drawdown in stocks
 - The cumulative shortfall is around 120 million metric tons

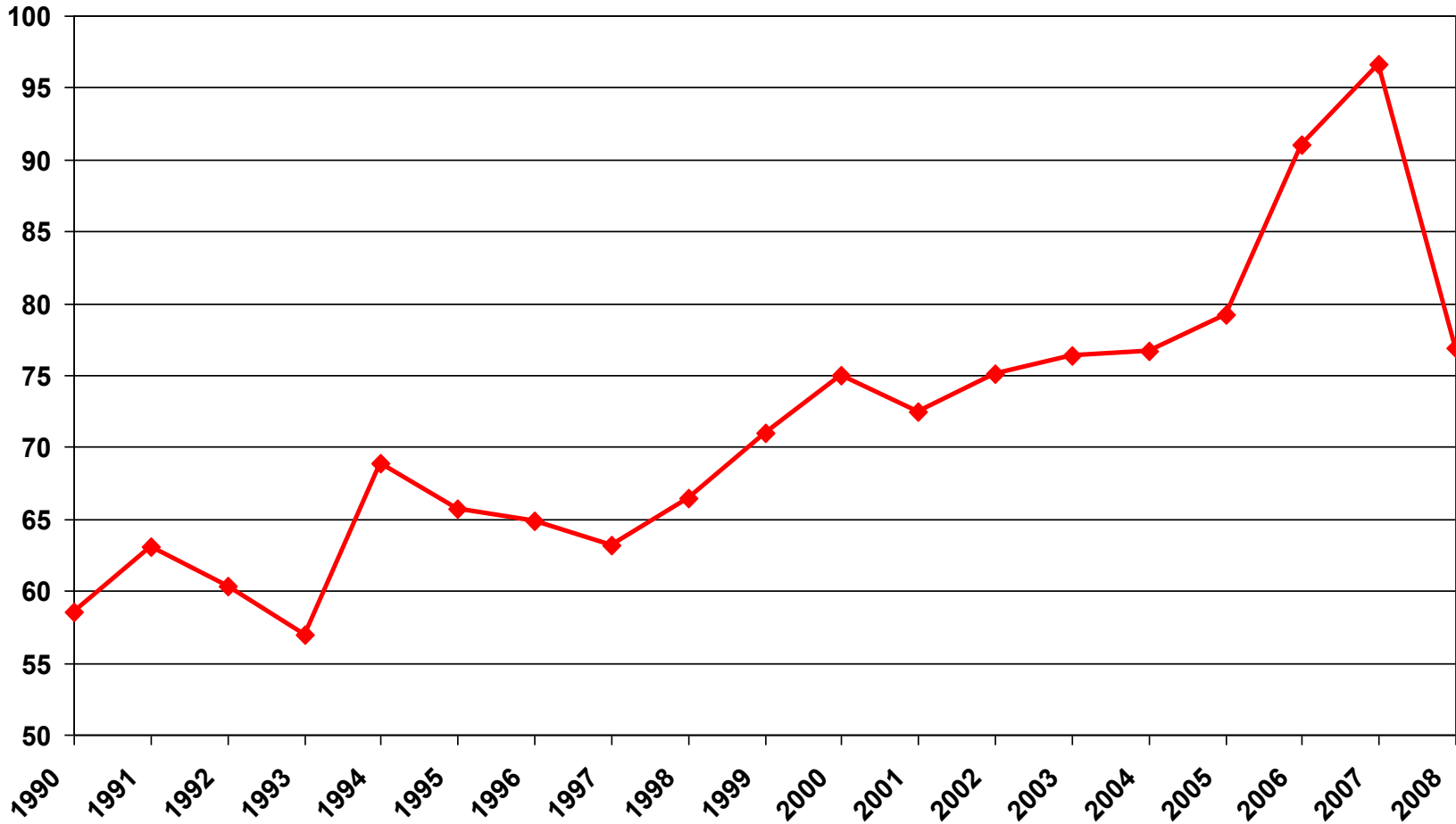
World Stocks-to-use Ratios

Percent



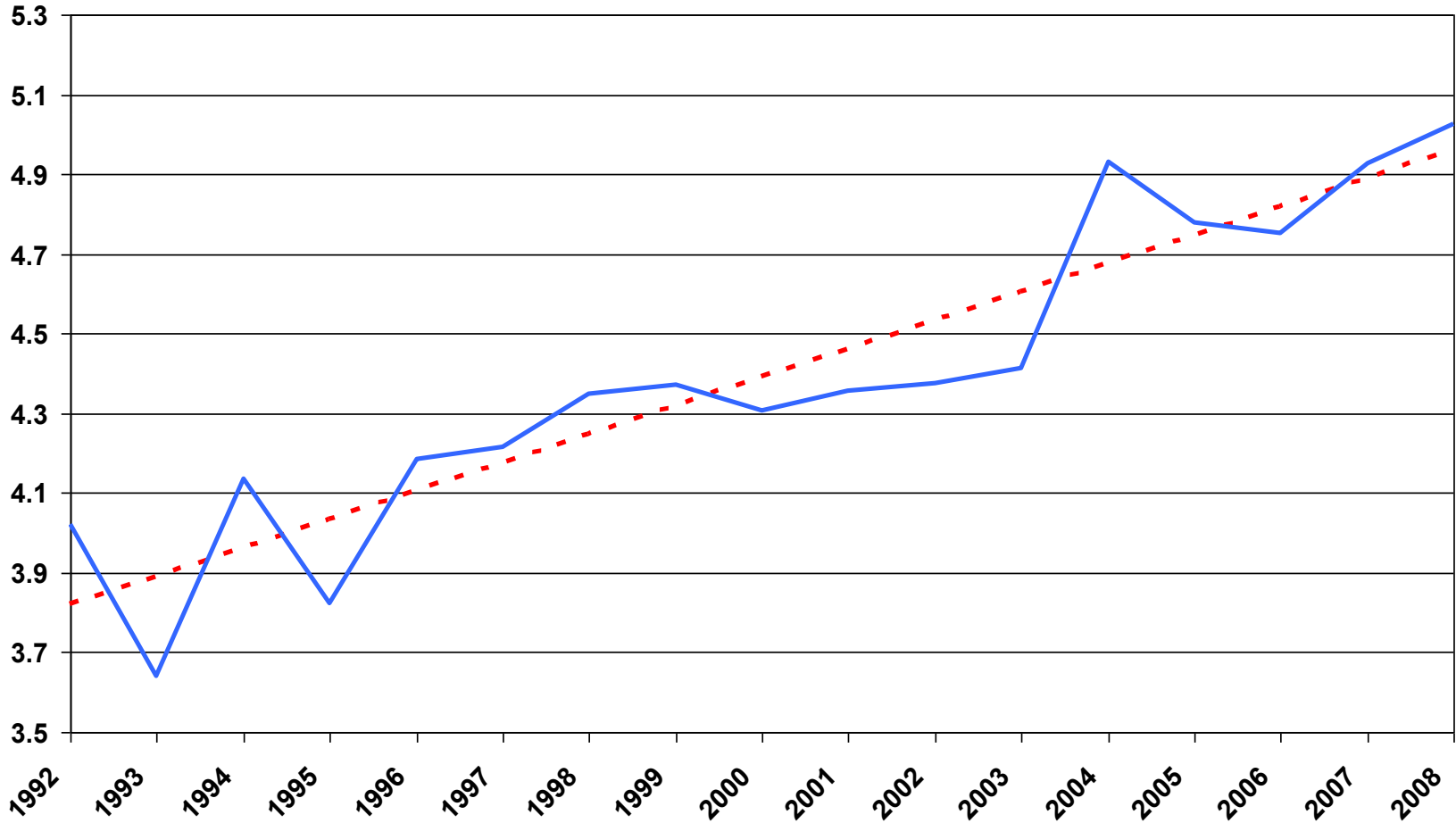
World Corn Trade

Million Tonnes



World Corn Yield was above trend

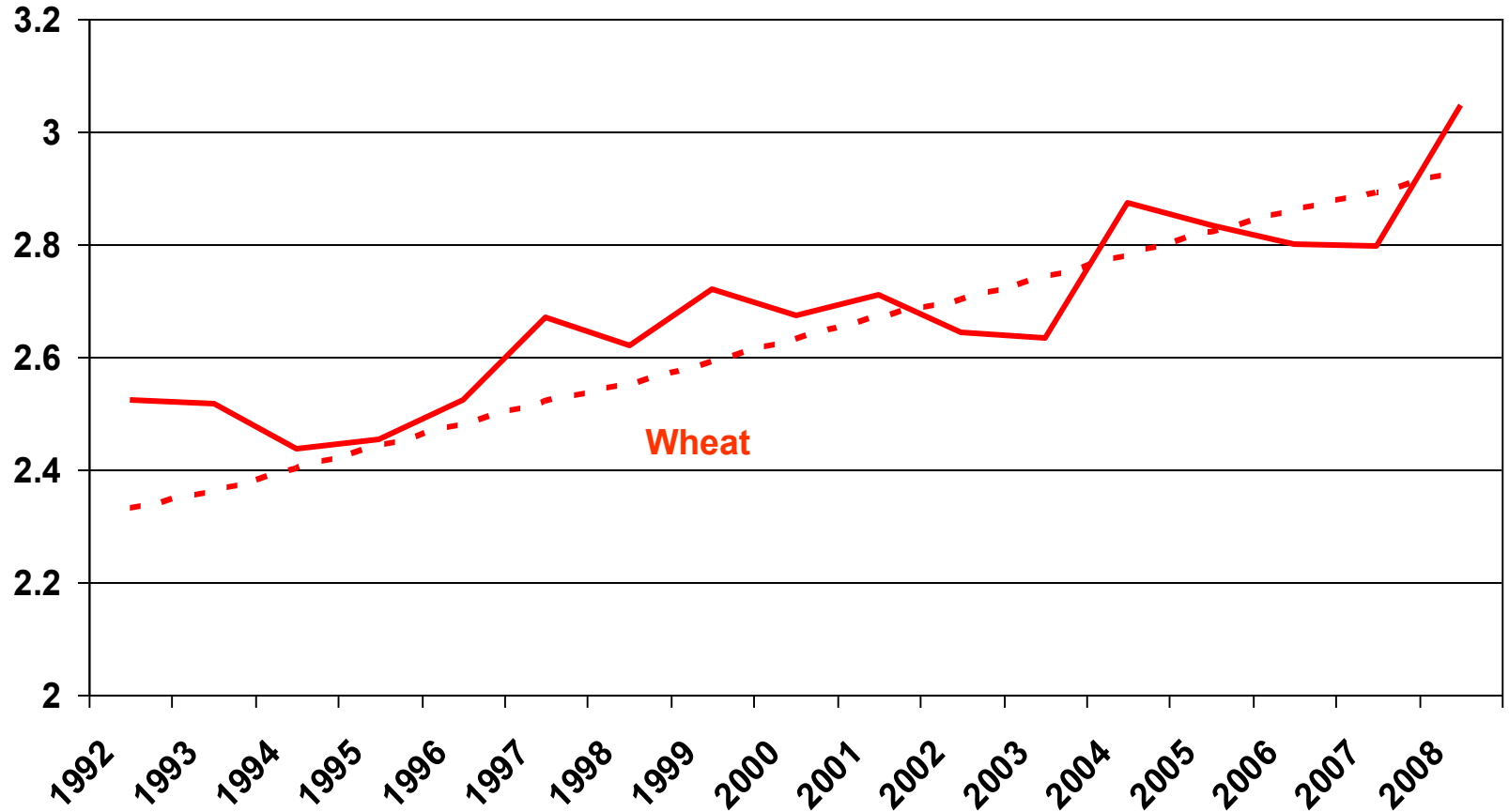
Tonnes per hectare



High yield boosted production by 10.5 million tonnes

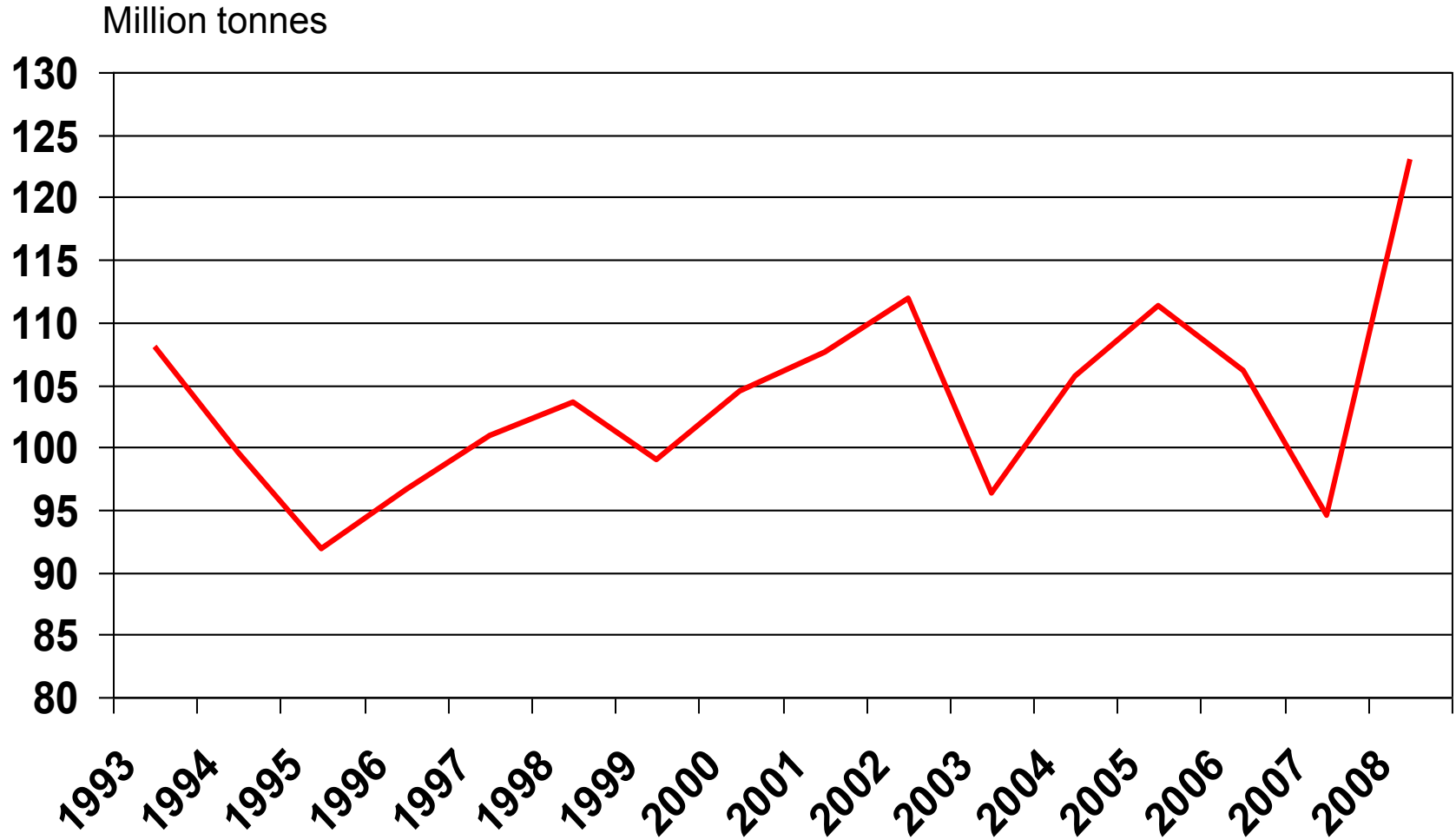
World wheat yields are record high

Tonnes per hectare



Wheat production was 26.3 mmt above trend

Wheat used for Feed



Feed quality wheat is competing with corn in world markets

Implications of Trend Yields

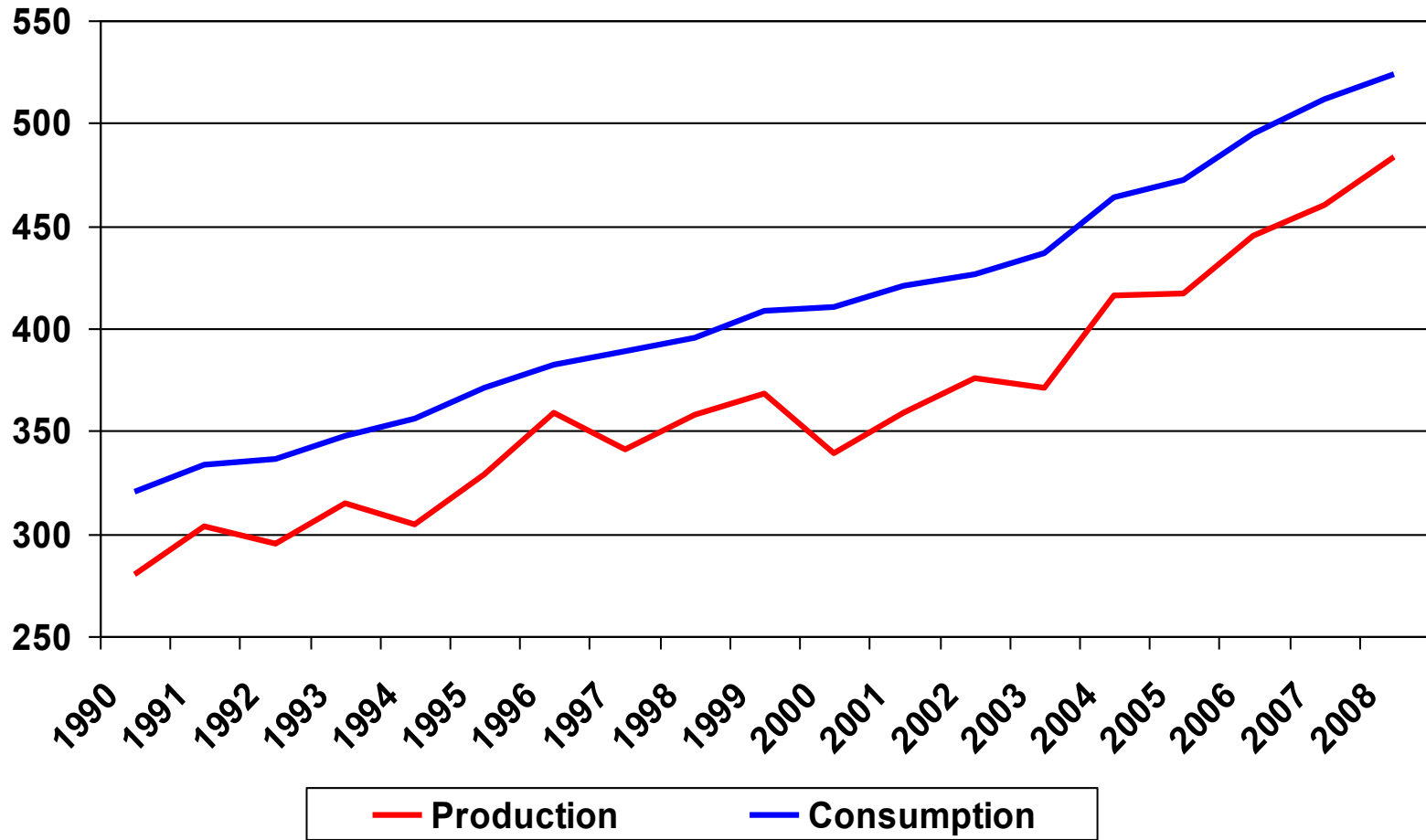
- **Foreign wheat production would have been 26 million tonnes lower**
 - The foreign wheat deficit would have been 31 mmt instead of 5 mmt
 - U.S. exports of 1.1 billion bushels + would have been needed
 - World wheat stocks would have gone down instead of up

- **Foreign corn production would also have been 10 million tonnes lower**
 - The deficit would have been 51 million tonnes
 - Implied U.S. corn exports of 2.0+ billion bushels
 - The 2007-08 deficit was 50 million tonnes
 - And U.S. corn exports were at record high levels

- ***Good – above trend - yields will be needed in 2009 and in future years!***

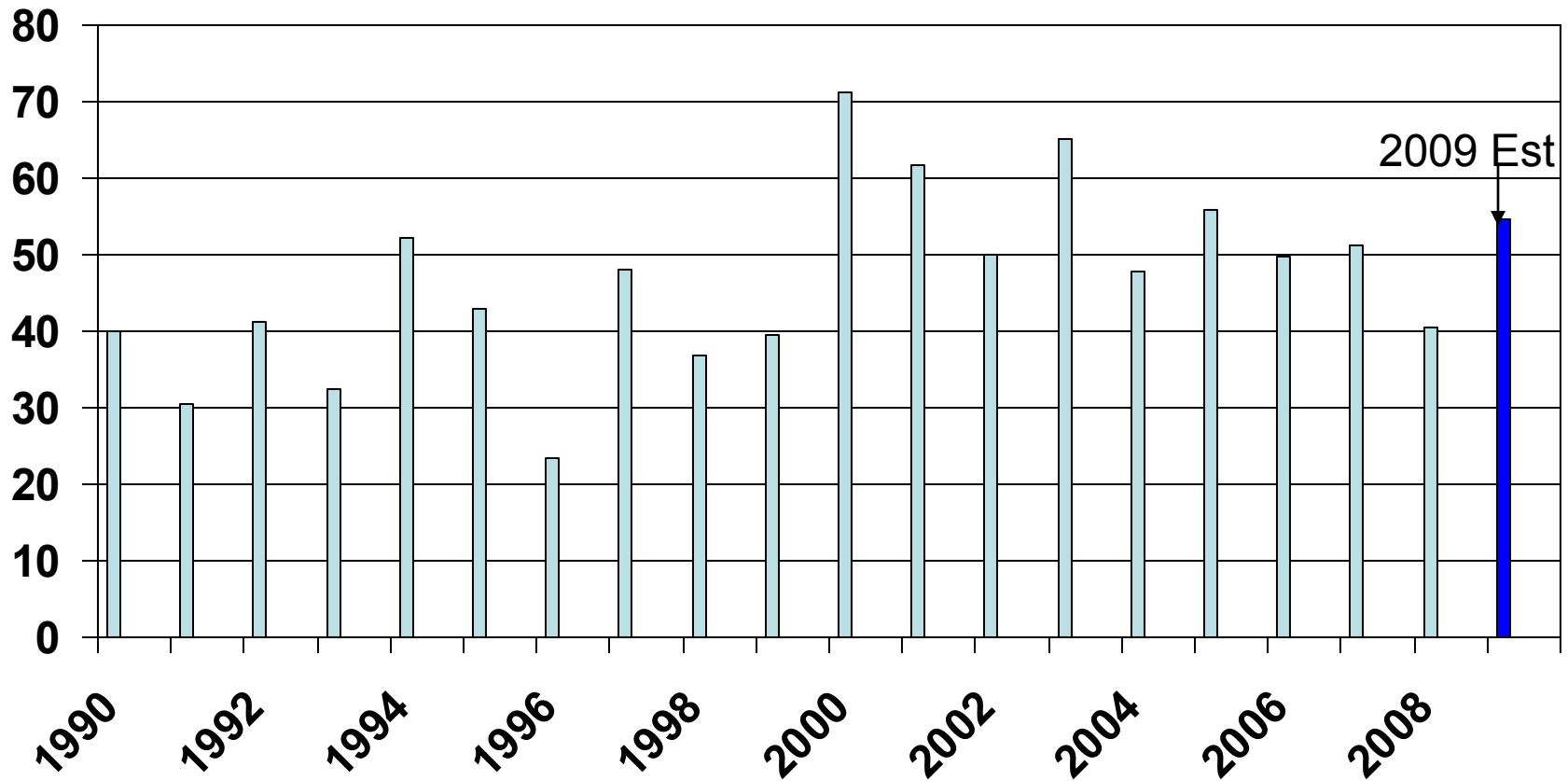
Foreign Corn Production and Use

Million tonnes



Foreign Corn Deficit

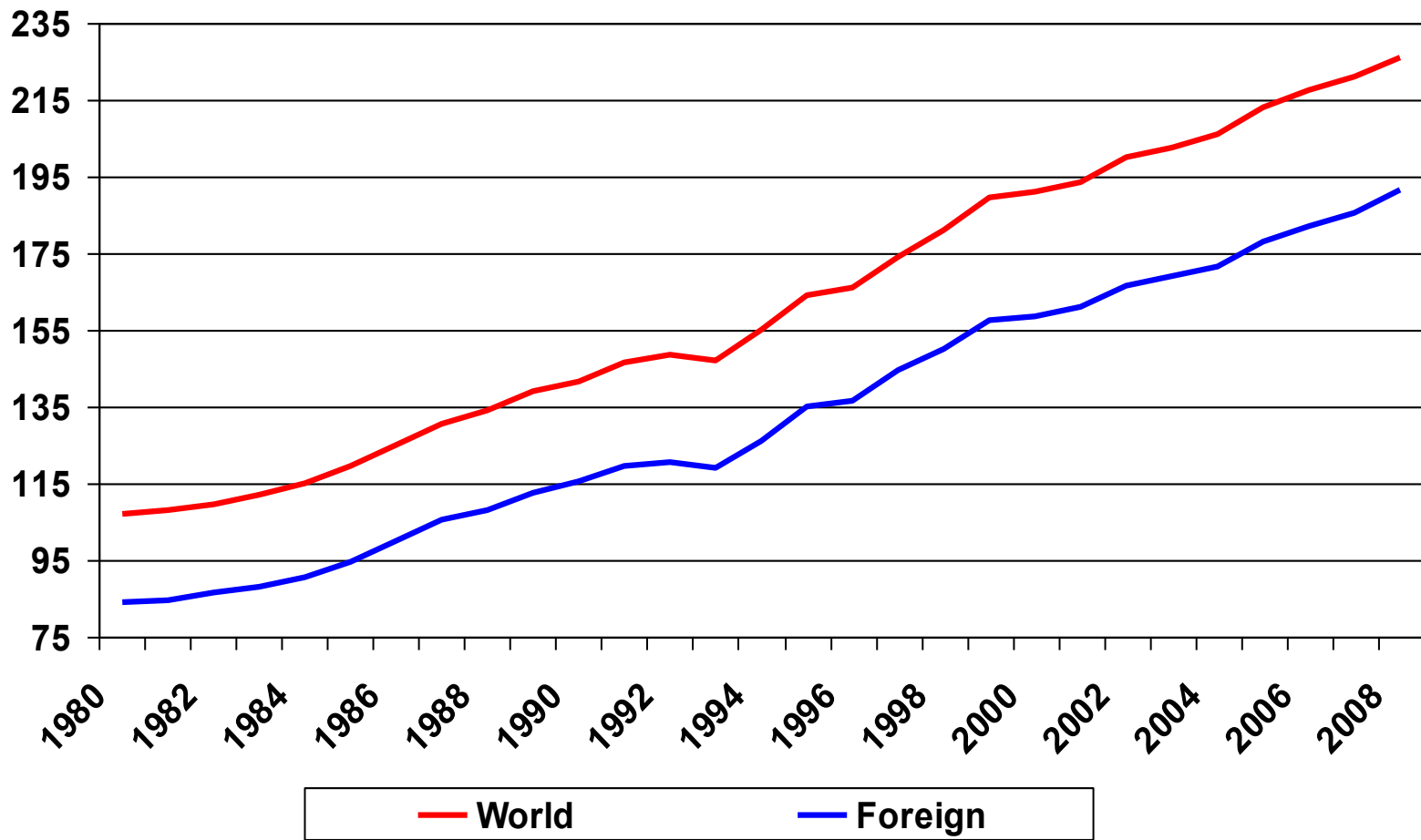
million tonnes



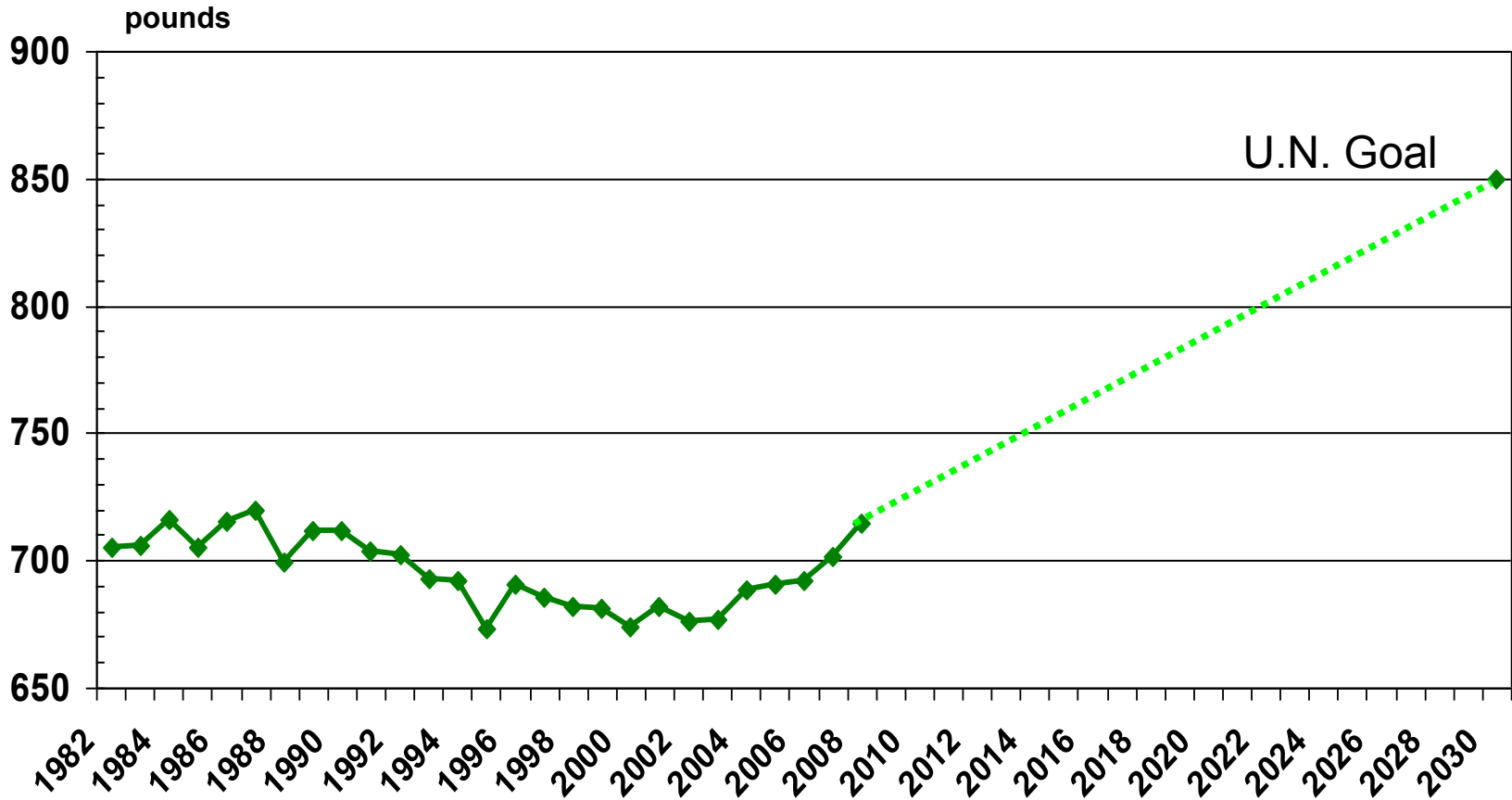
2009 estimate based on area, yield and use trends

Meat Consumption is Rising

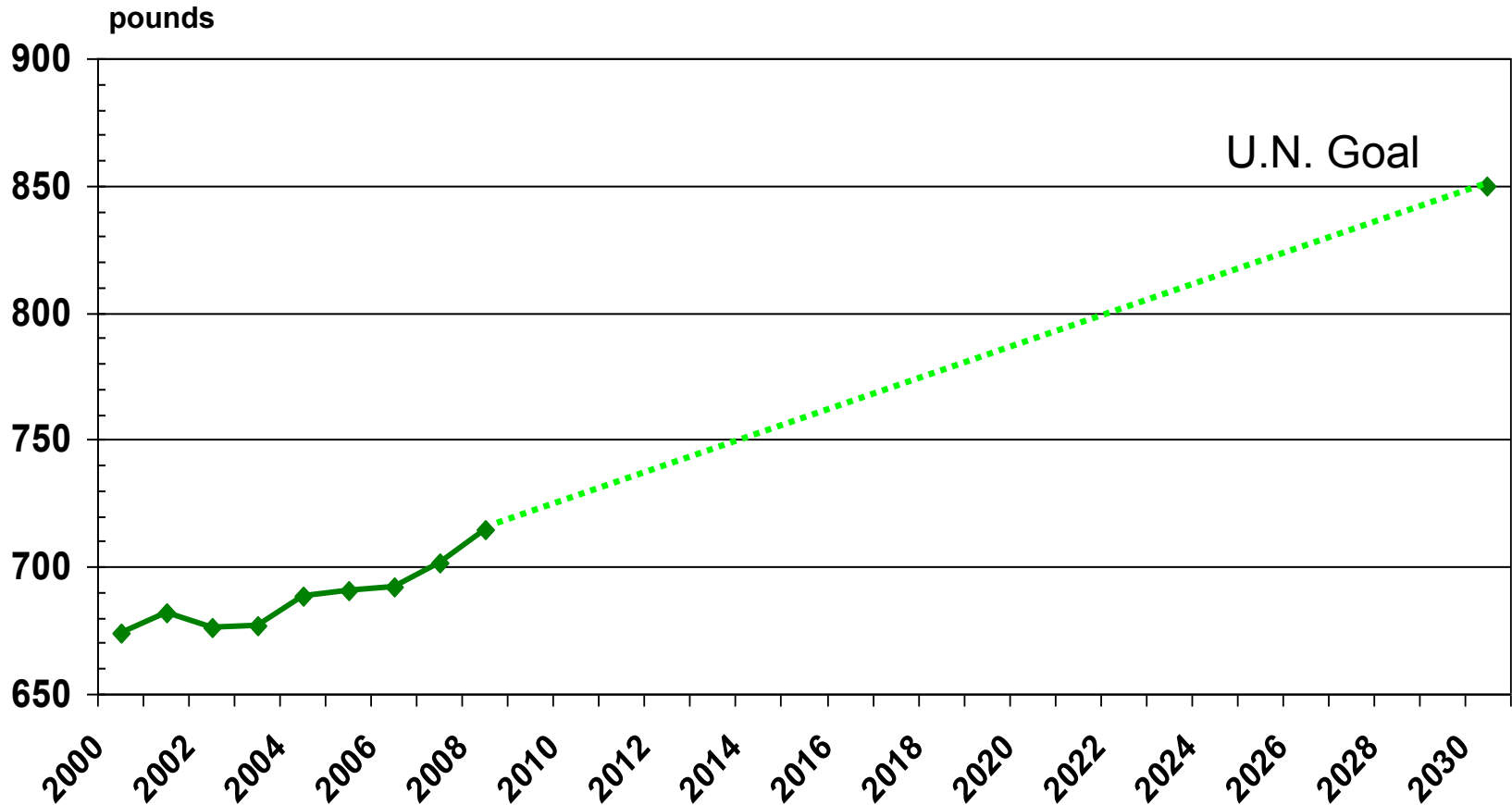
Million tonnes



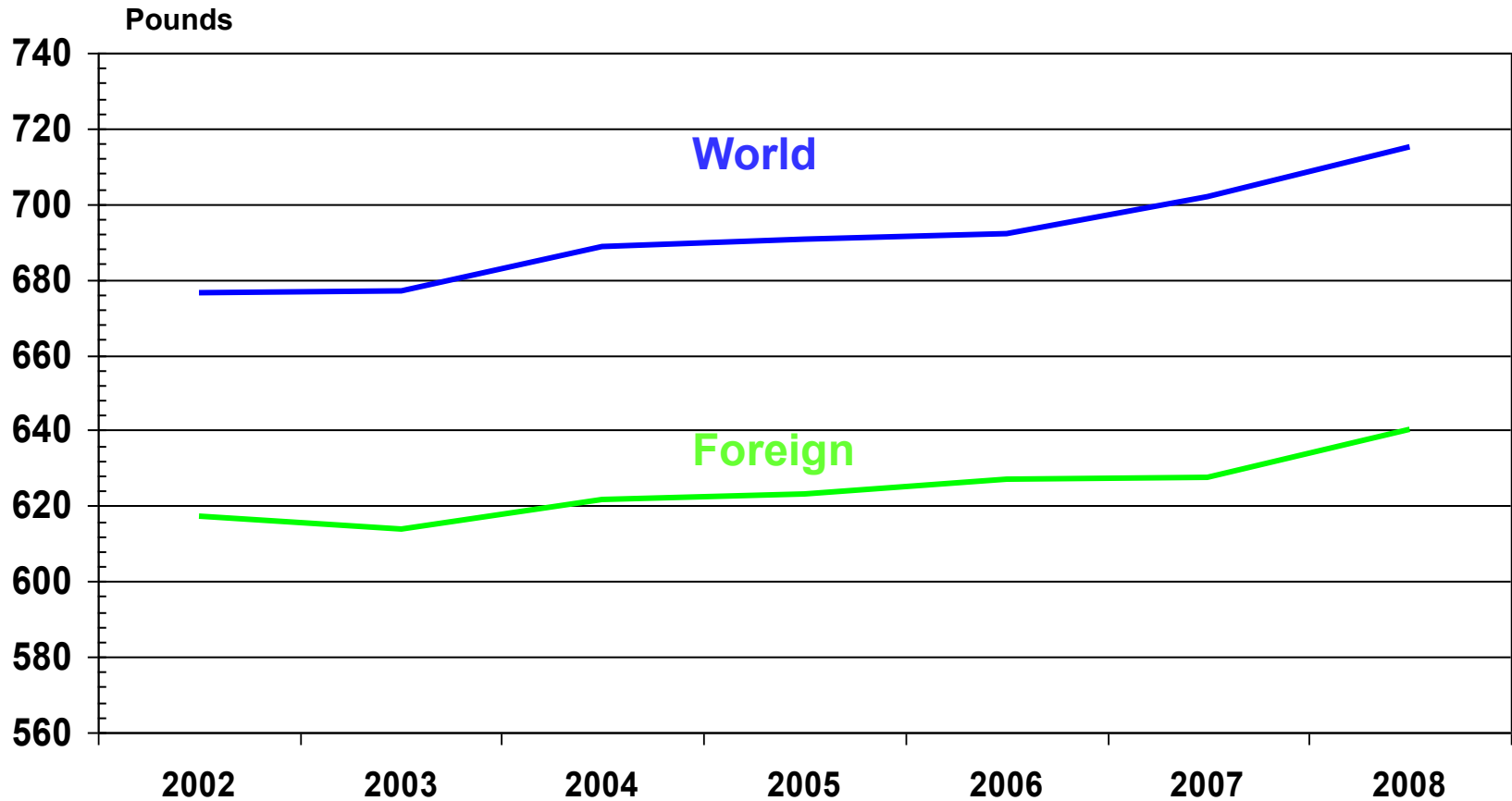
World Grain Per Capita Consumption



World Grain Per Capita Consumption



Per Capita Grain Consumption



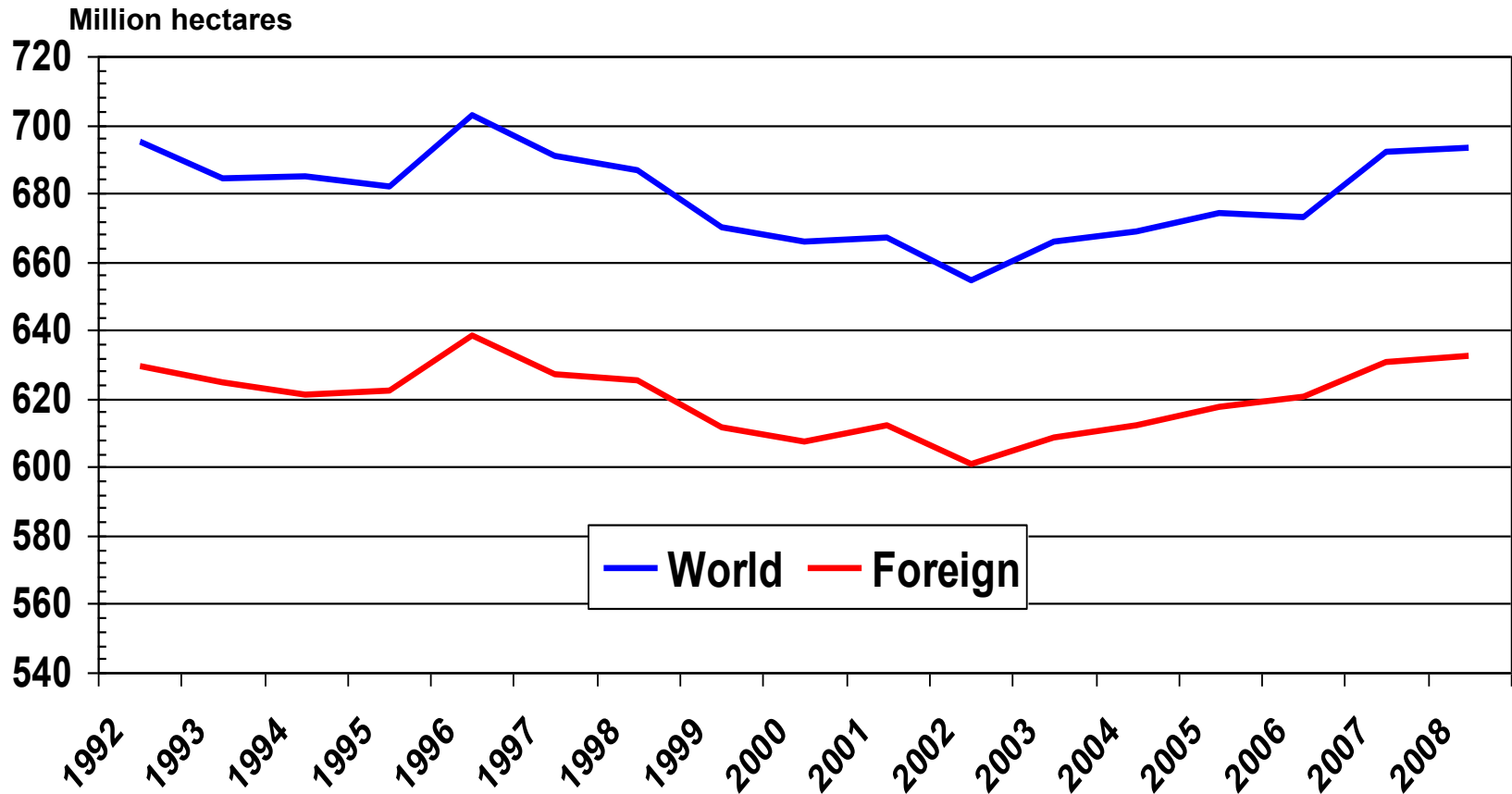
Expected Grain Demand Growth

- Population rises at about 80 million per year
 - That will boost demand by 400 mmt by 2023
- Per capita consumption is rising
 - About 5 pounds per year
 - That adds another 270 mmt to demand
- ***We need to boost production by about 650 mmt between now and 2023***

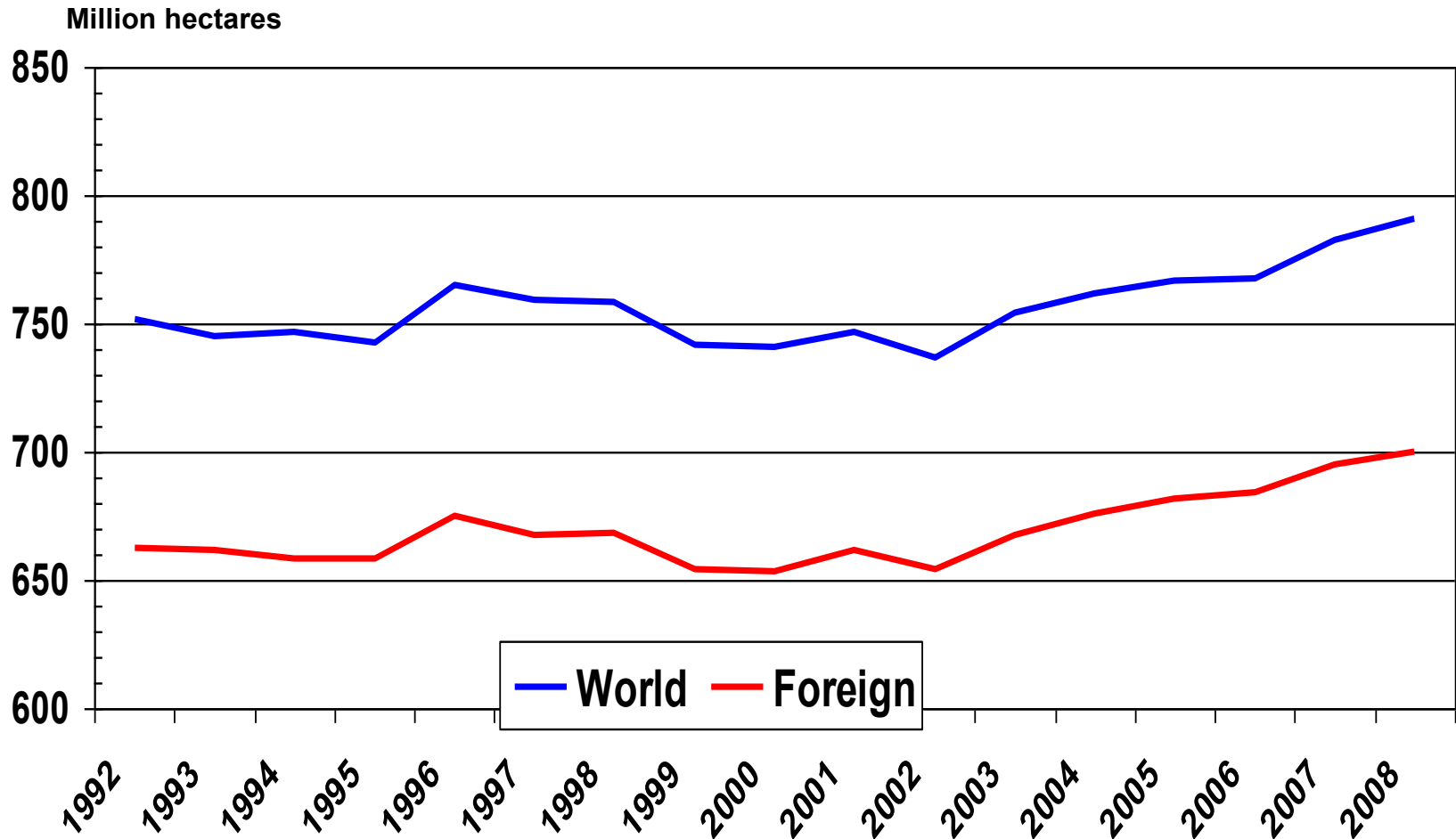
How Will We Do It?

- Higher Yields will be needed
 - And yield growth is generally accelerating
- We will also need more acreage
- With no change in yields – we would need an additional 540 million acres!!

World Grain Area

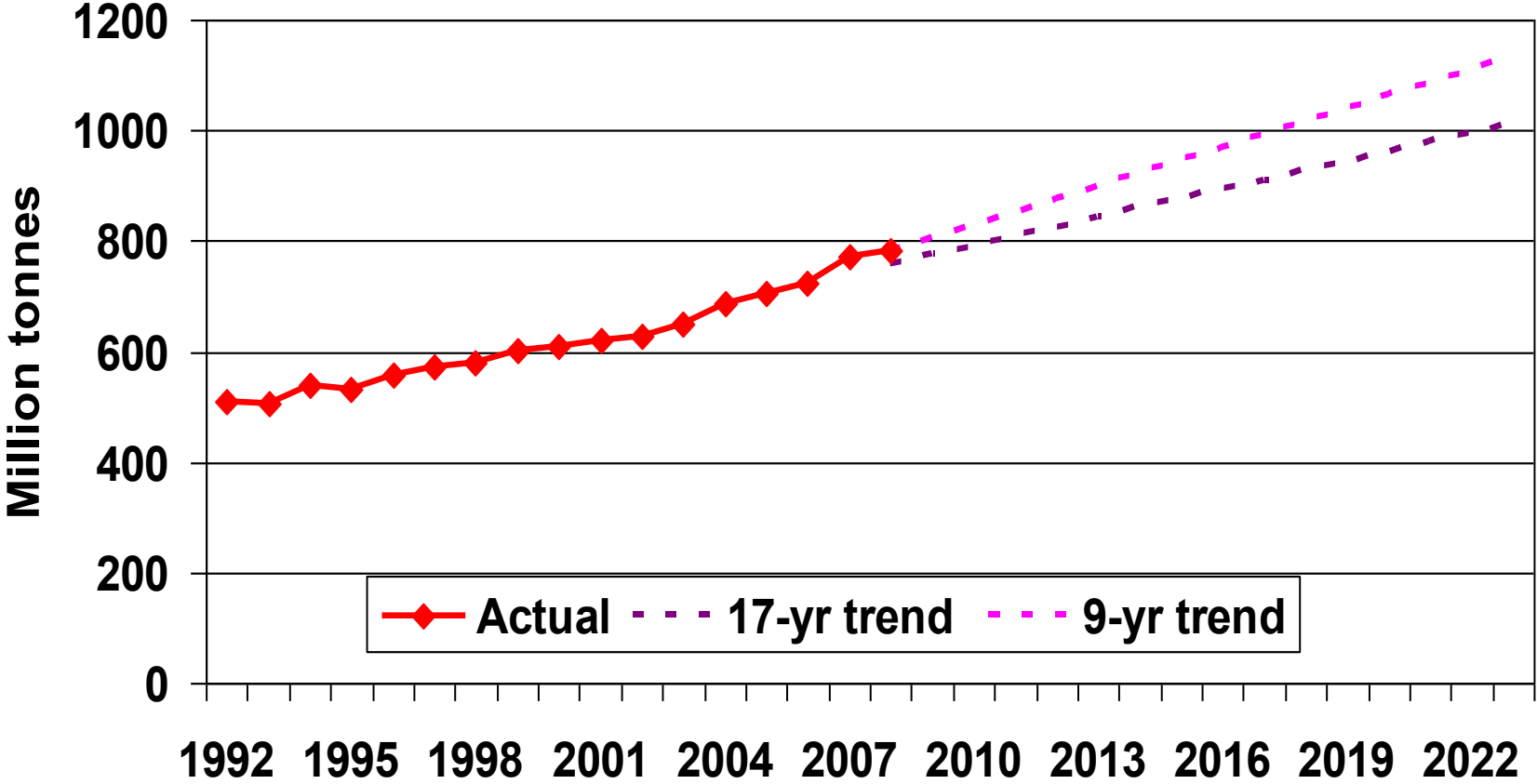


World Grain & Soybean Area

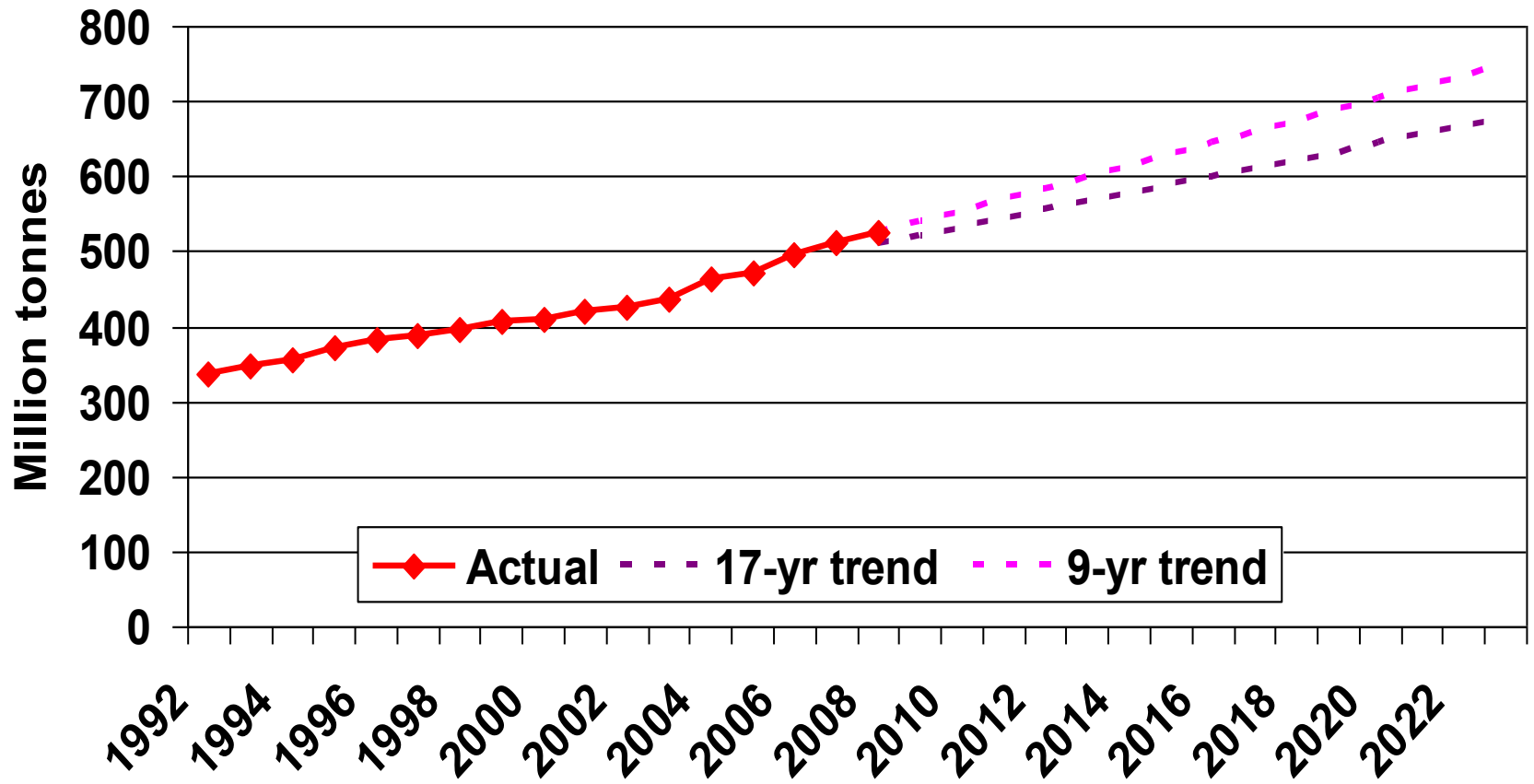


We are already at record high levels

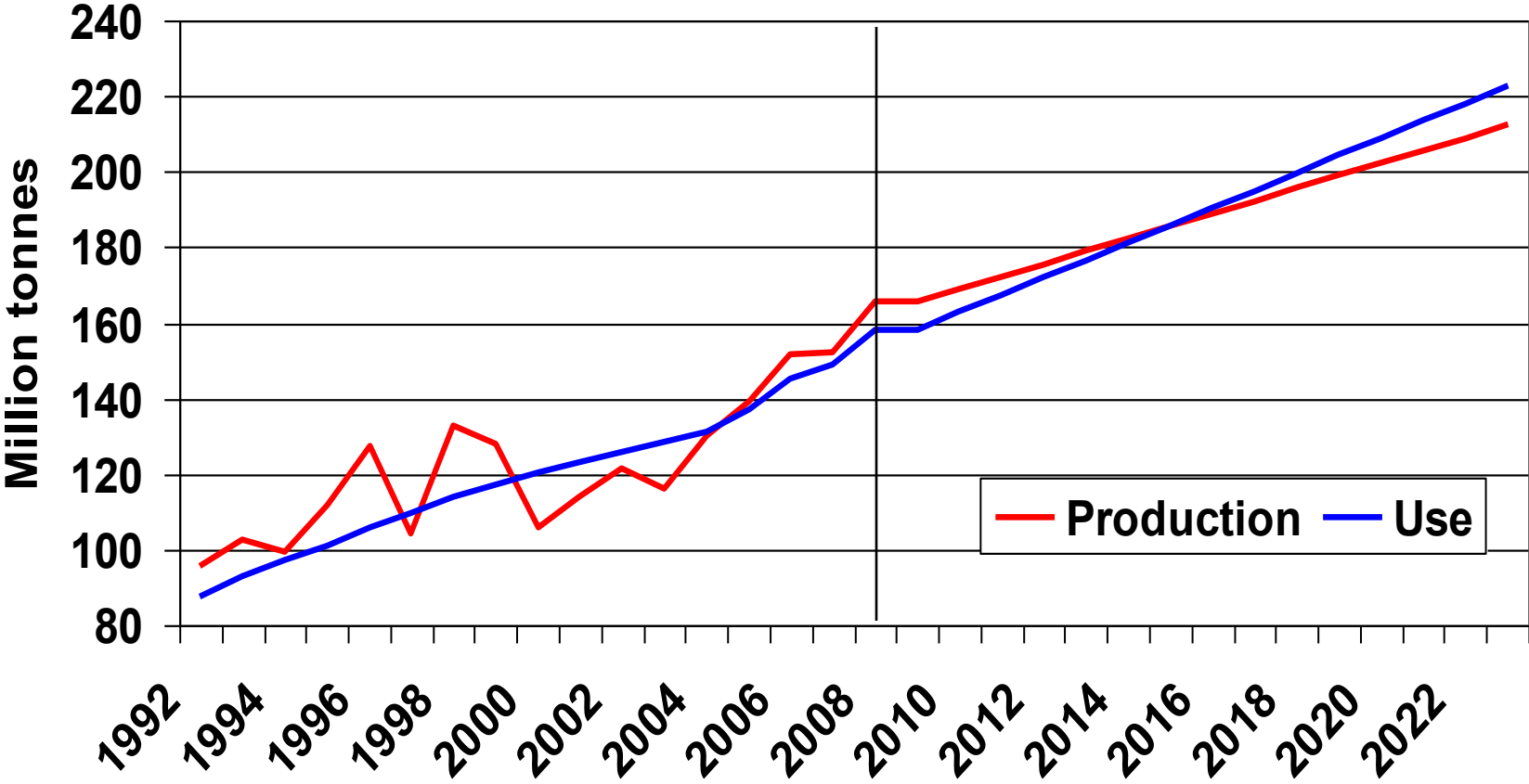
Corn Consumption



Foreign Corn Consumption



China's Corn Balance

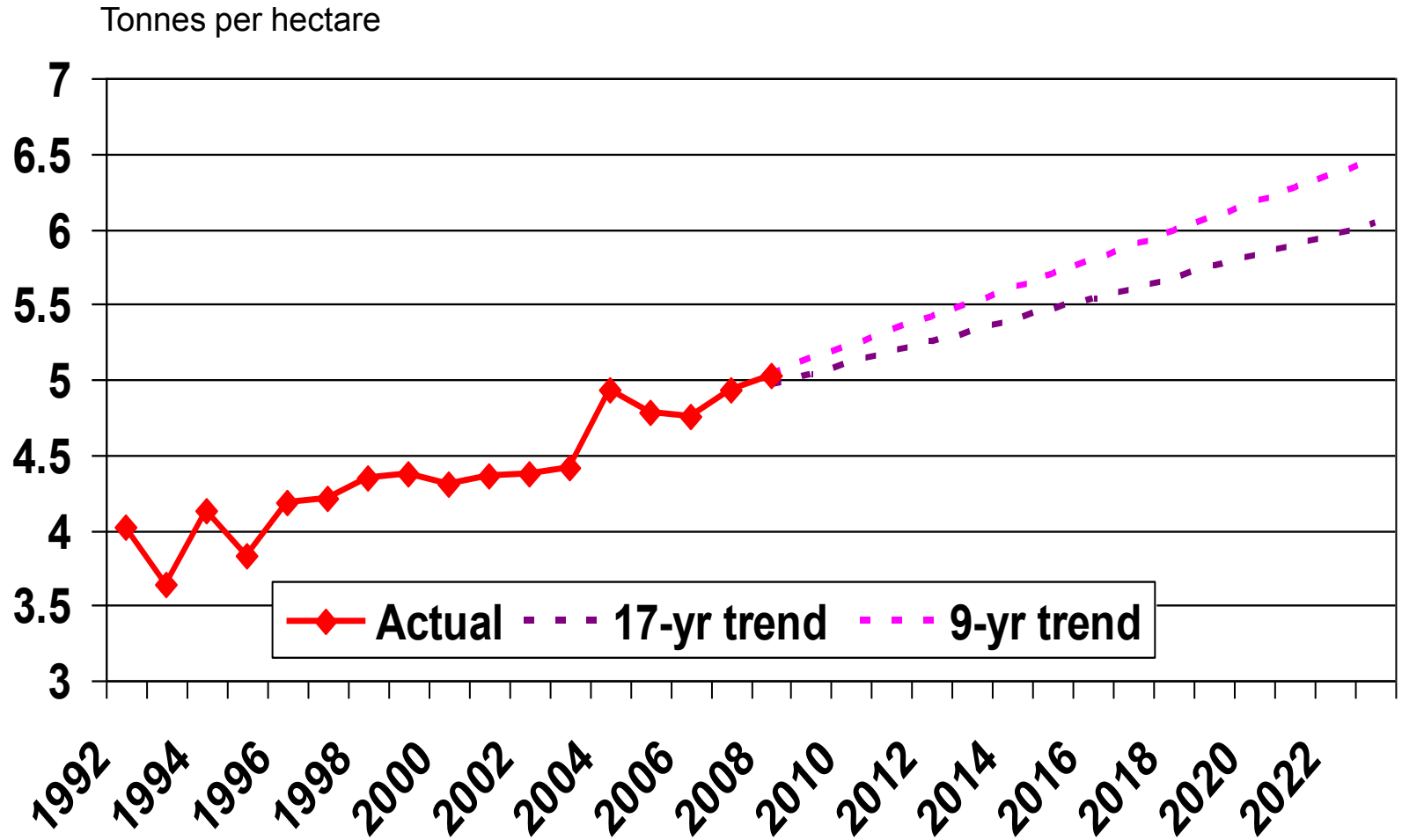


Deficit is 10 million tonnes in 2023-24

Some Implications

- To keep pace – foreign yields need to rise 0.11 tonnes/hectare/year
- Now they are rising at 0.08 tonnes/hectare/year
- Bottom line –
 - Foreign acreage will need to rise
 - Yield growth will have to accelerate
 - or the gap will be filled by higher U.S. exports
- Even with the U.S. included – yields are not rising fast enough

World Corn Yields



Corn Deficit with No Change in Acreage

million tonnes

| | Africa | Mexico | Middle east | Other Latin Amer. | China |
|-----------------|--------|--------|-------------|-------------------|--------------|
| Deficit in 2008 | 9.4 | 8.4 | 9.5 | 11.5 | 8 surplus |
| Deficit in 2023 | 20.8 | 16.8 | 16.6 | 23.3 | 10.3 deficit |

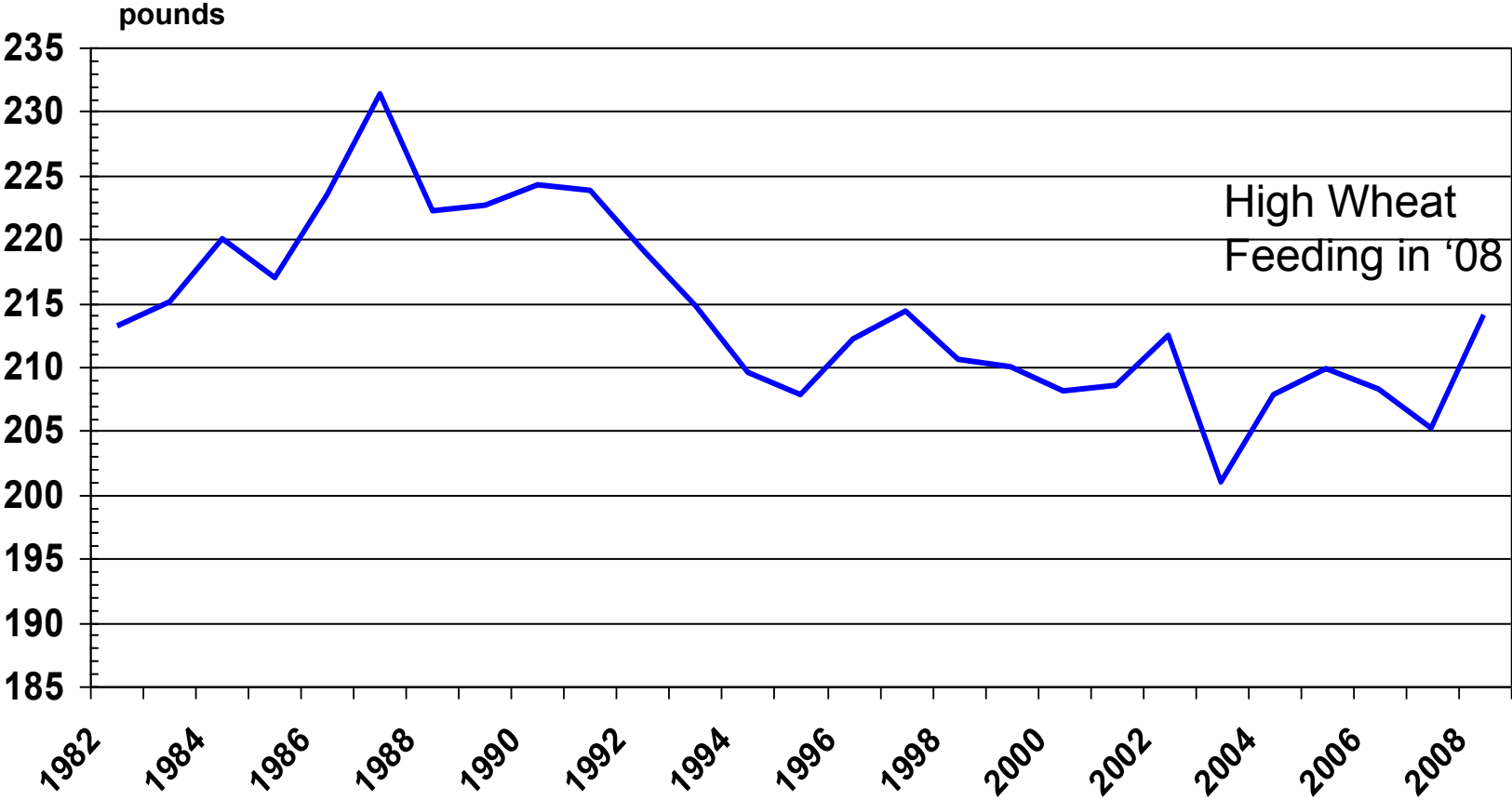
Change in Corn Area Since 1993

million hectares

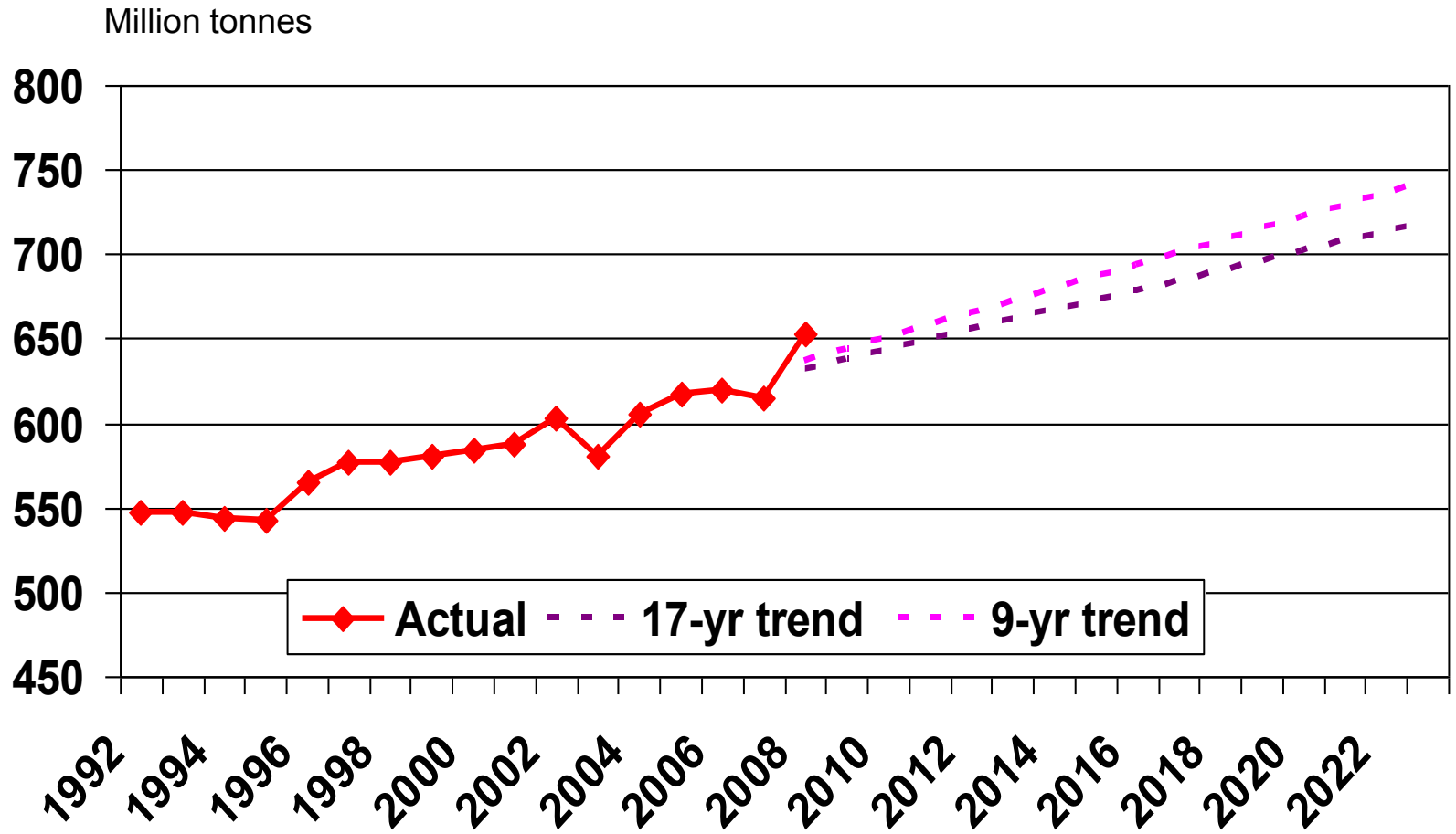
| Africa | Mexico | Middle east | Other Latin Amer. | China |
|--------|--------|-------------|-------------------|-------|
| 4.9 | -0.3 | 0.1 | 0.8 | 8.7 |

There has been almost no increase in area in Brazil, Argentina, and Canada from 1993 to 2008

World Wheat Per Capita Consumption



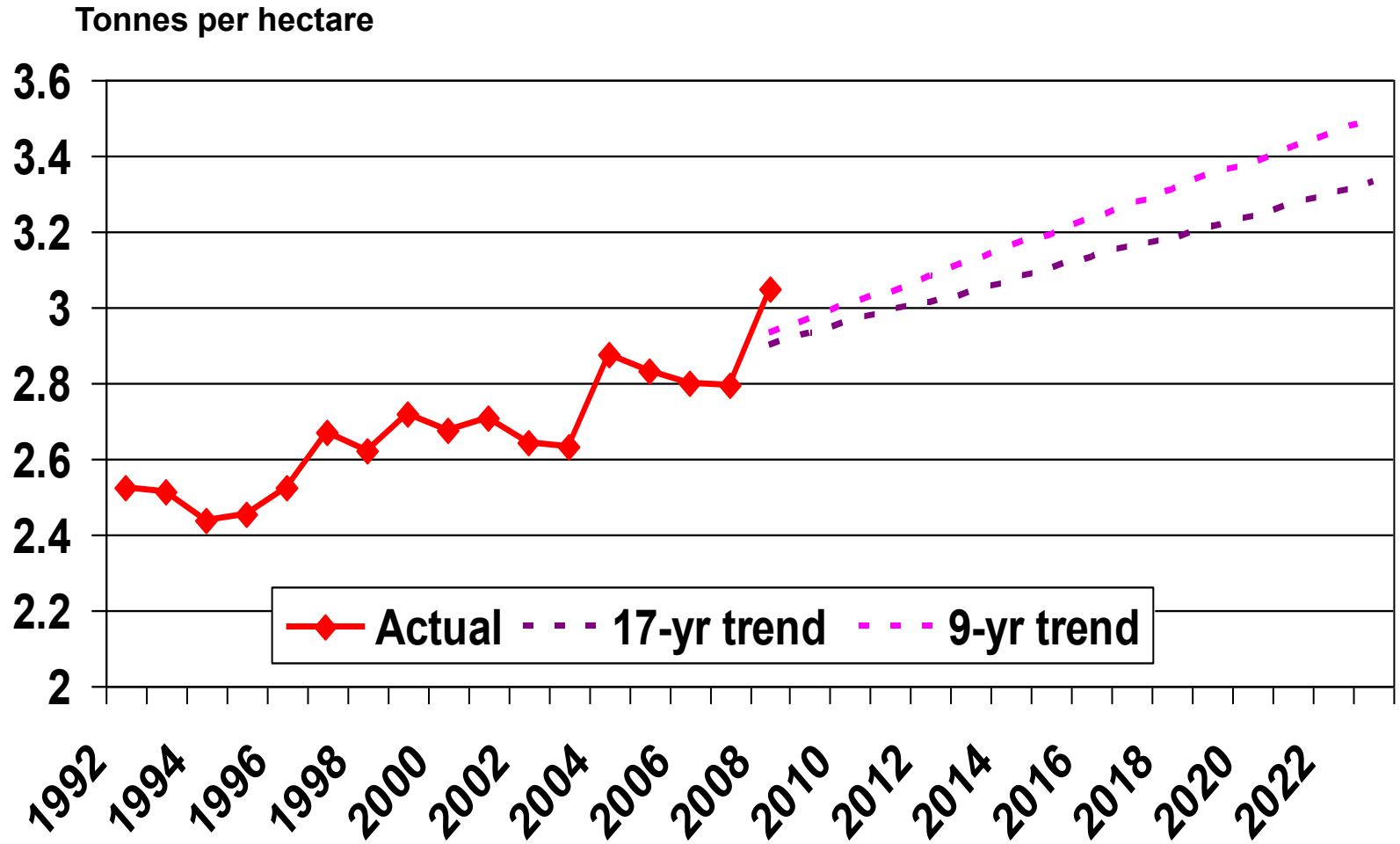
Wheat Consumption



World Wheat Situation

- Per capita consumption is flat at best
- Yields need to rise by 0.028 tonnes per hectare to keep pace
- Trend yield growth is 0.026 – just about enough to keep pace with demand growth
- Total wheat area may not need to increase
- But deficits in some regions will rise
 - Africa, India, East Asia, and the Middle East

Wheat Yields

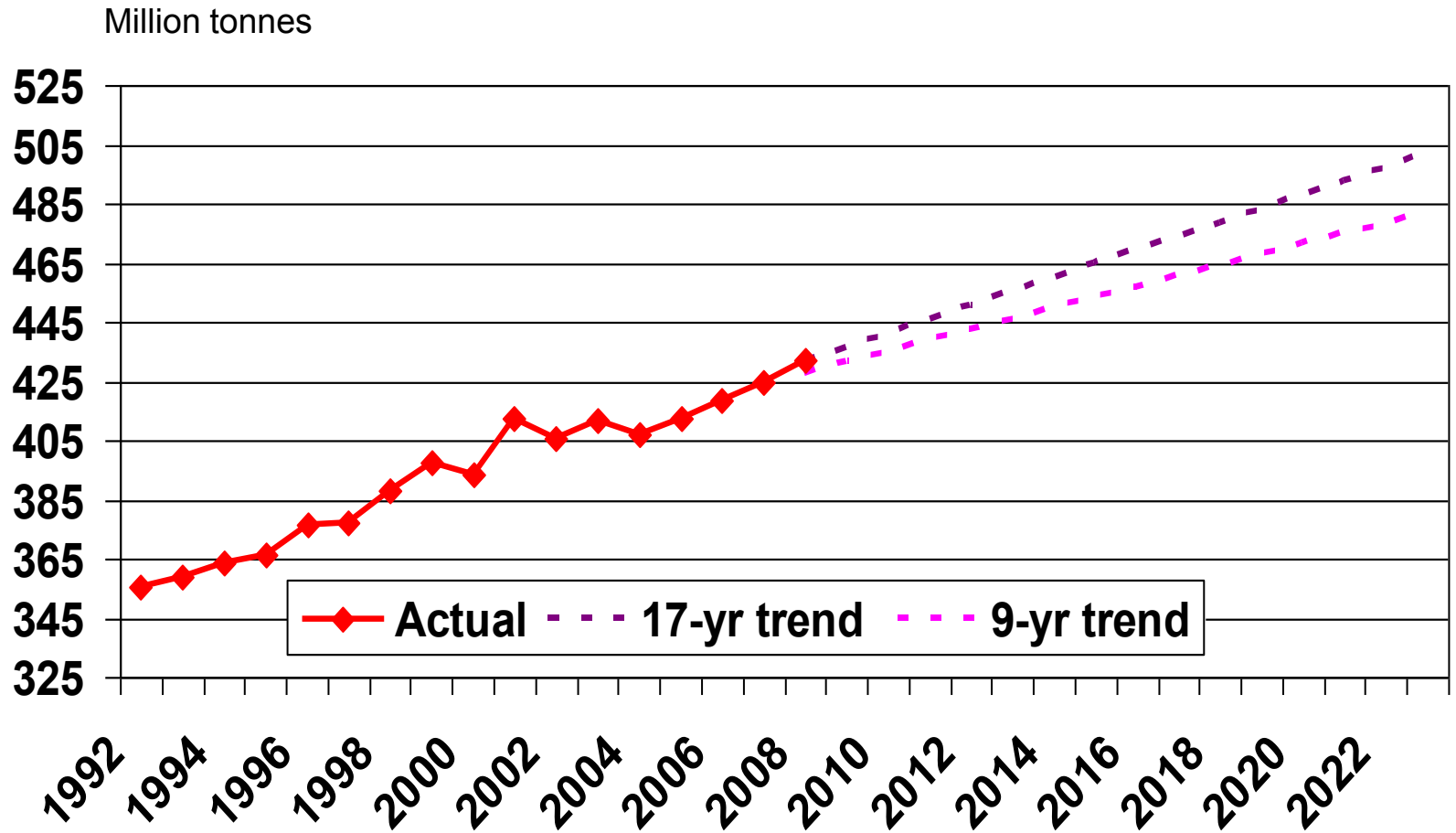


Wheat Deficit with No Change in Acreage

million tonnes

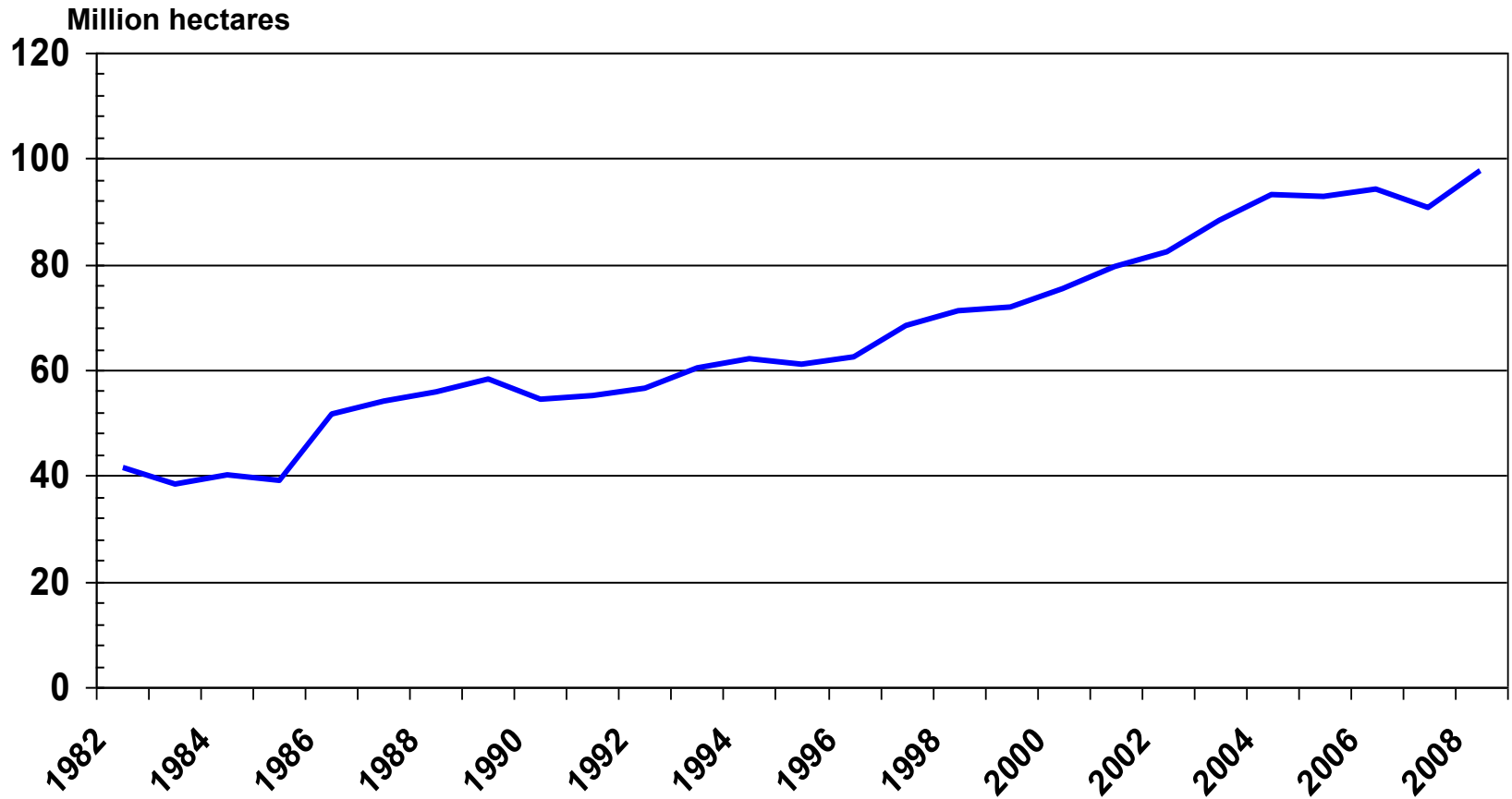
| | Africa | Mexico | Middle east | India | All foreign |
|-----------------|--------|--------|-------------|-----------------|-------------|
| Deficit in 2008 | 33 | 20.5 | 15.7 | +1.2 surplus | 20.0 |
| Deficit in 2023 | 54 | 31.2 | 18.0 | 8.3 deficit | 43.0 |

Rice Consumption



Based on yield and demand trends we actually need about 1 million fewer hectares of rice

World Soybean Area

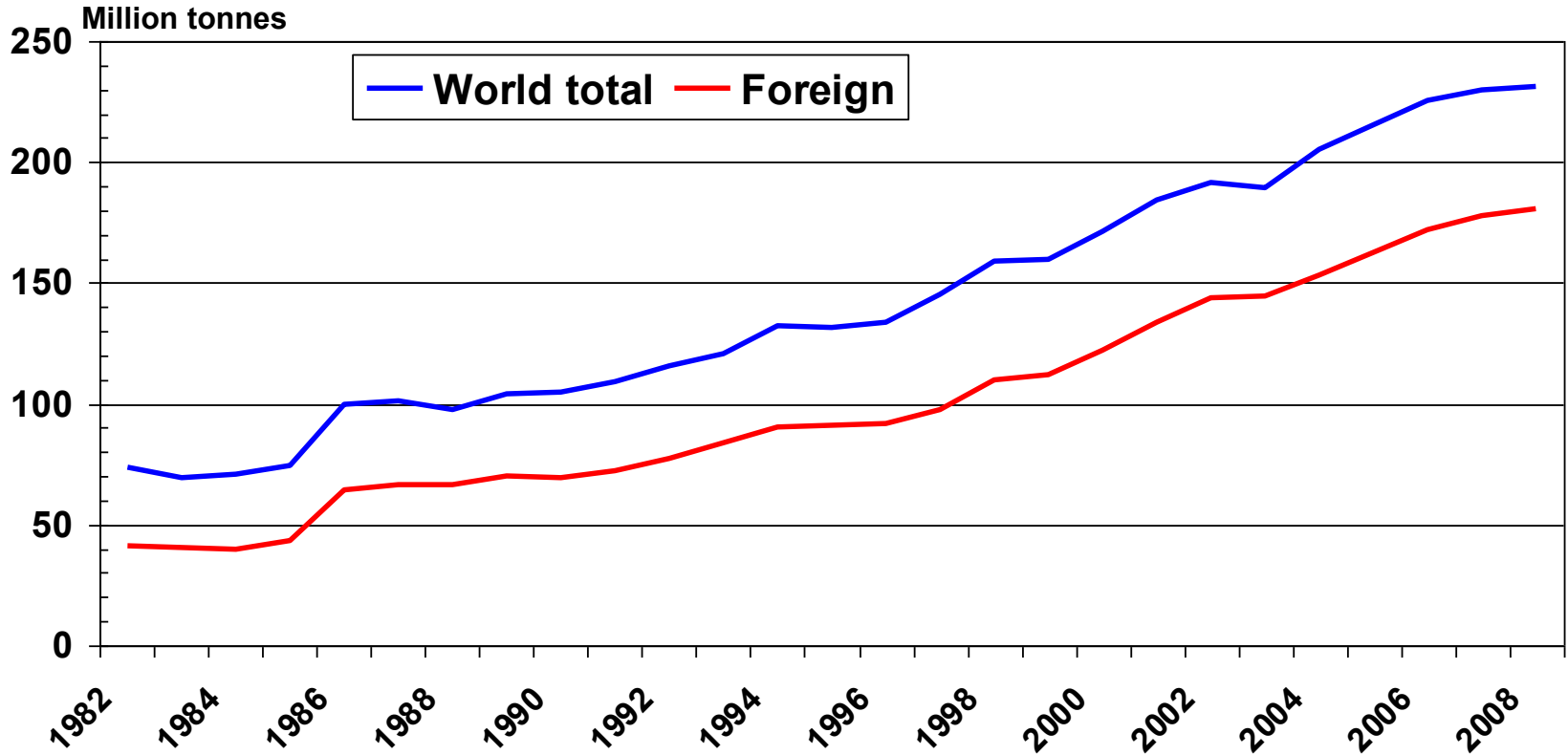


Change in Soybean Area Since 1986

million hectares

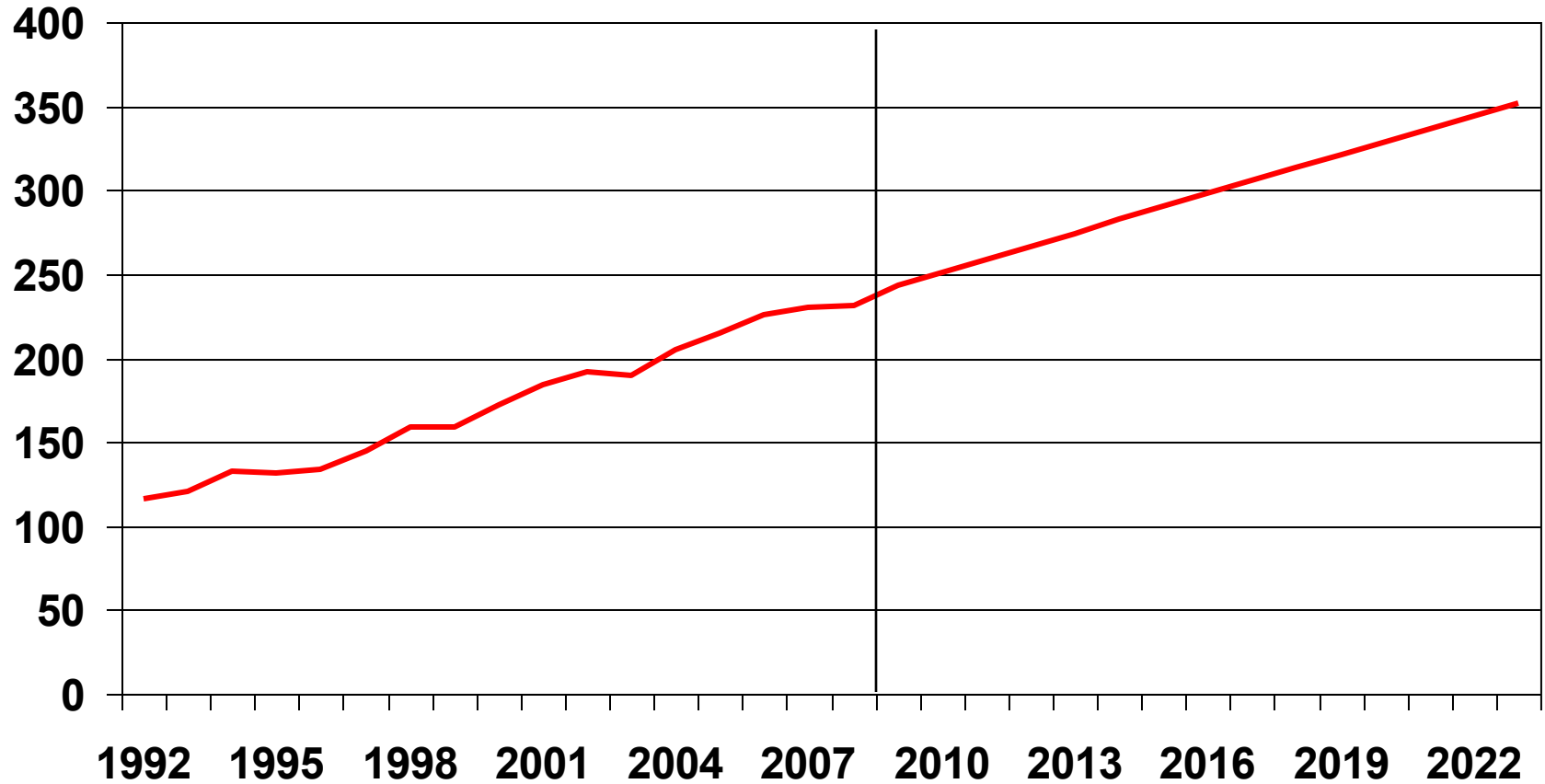
| Other Lat. Amer. | Argentina | Brazil | India | U.S. | Total |
|---------------------|-----------|--------|-------|------|-------|
| 3.0 | 14.5 | 12.0 | 8.1 | 6.6 | 46.2 |

World Soybean Consumption

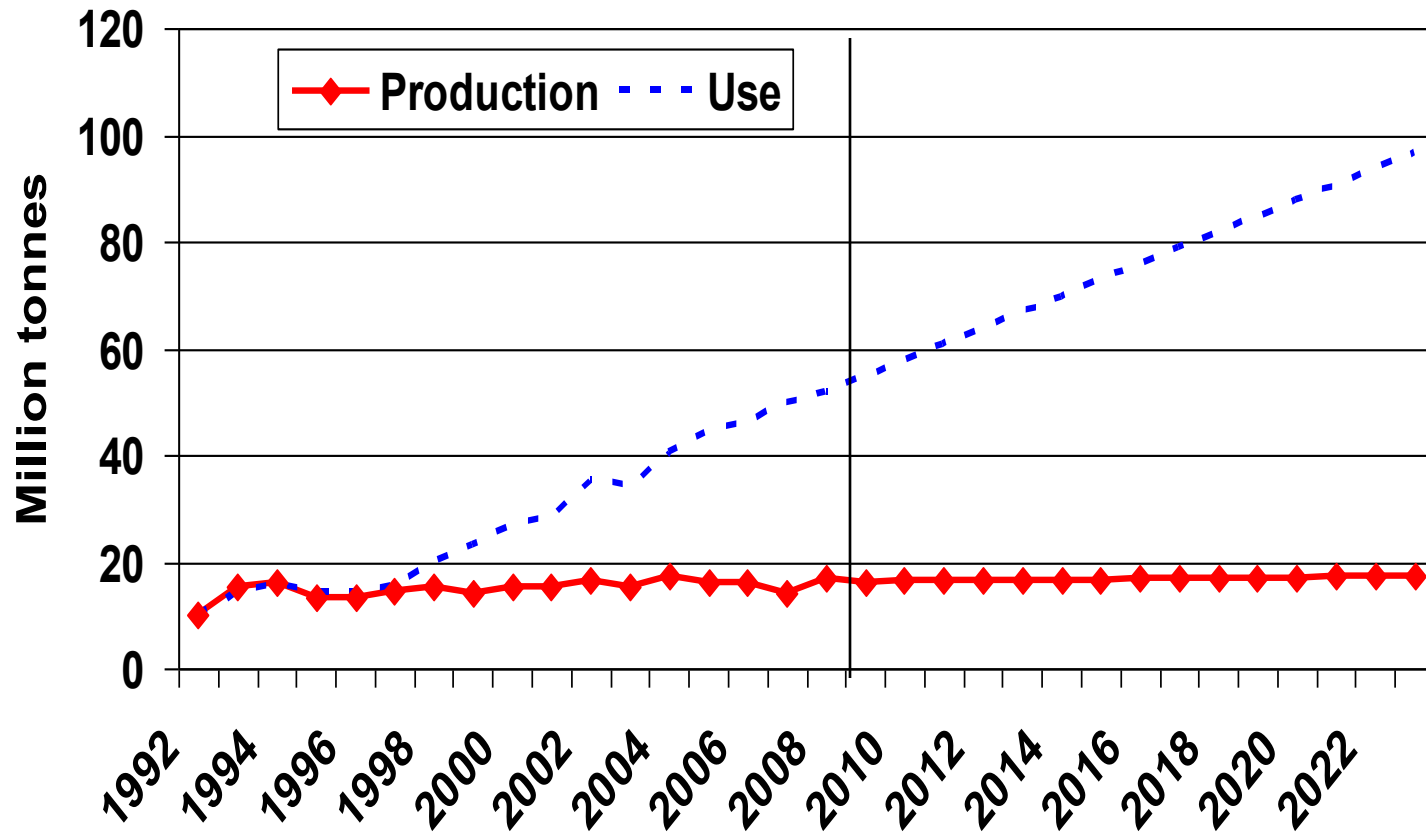


World Soybean Consumption

Million tonnes



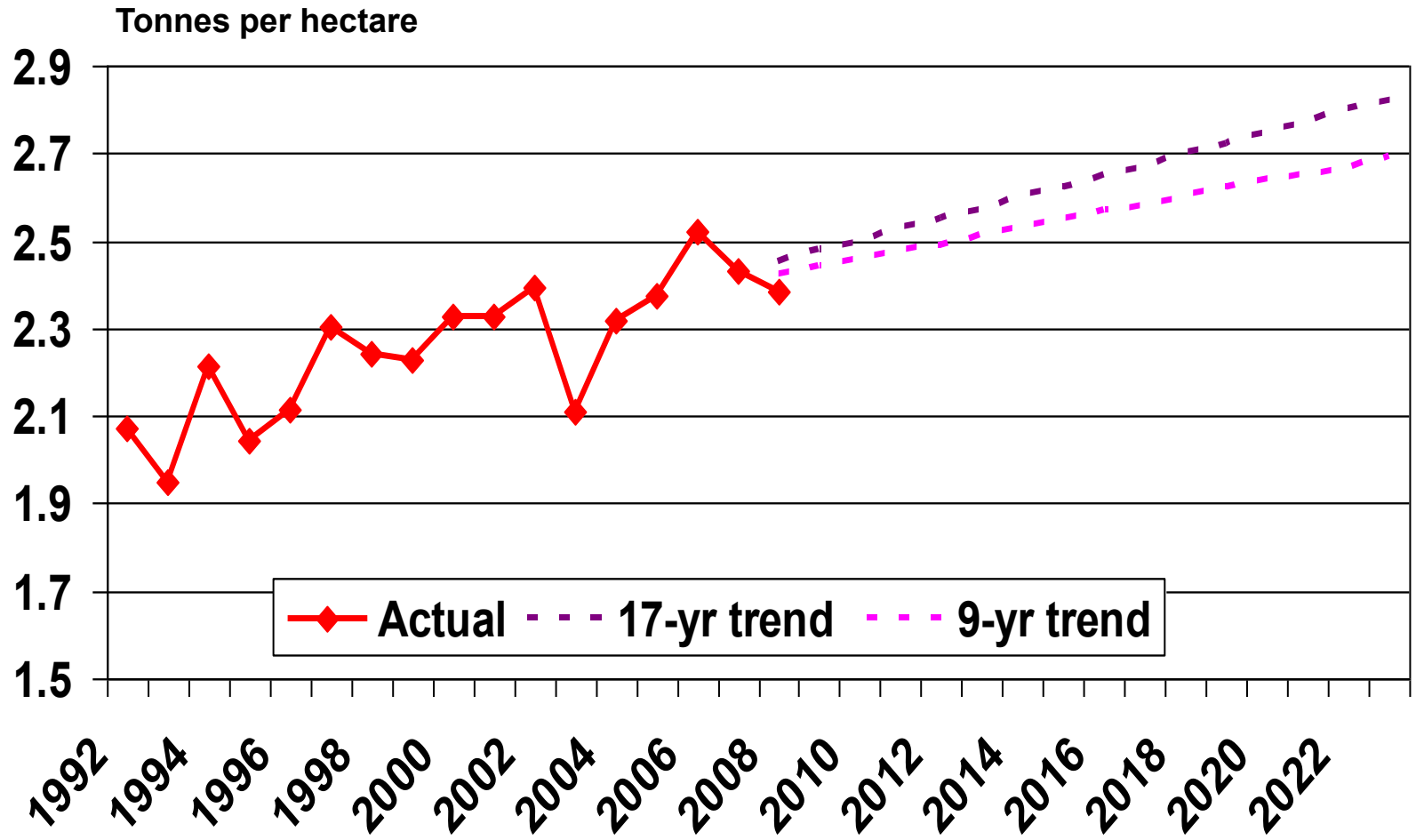
China's Soybean Balance



Deficit is 79 million tonnes in 2023-24

US Production was 80 mmt in 2008

Soybean Yields

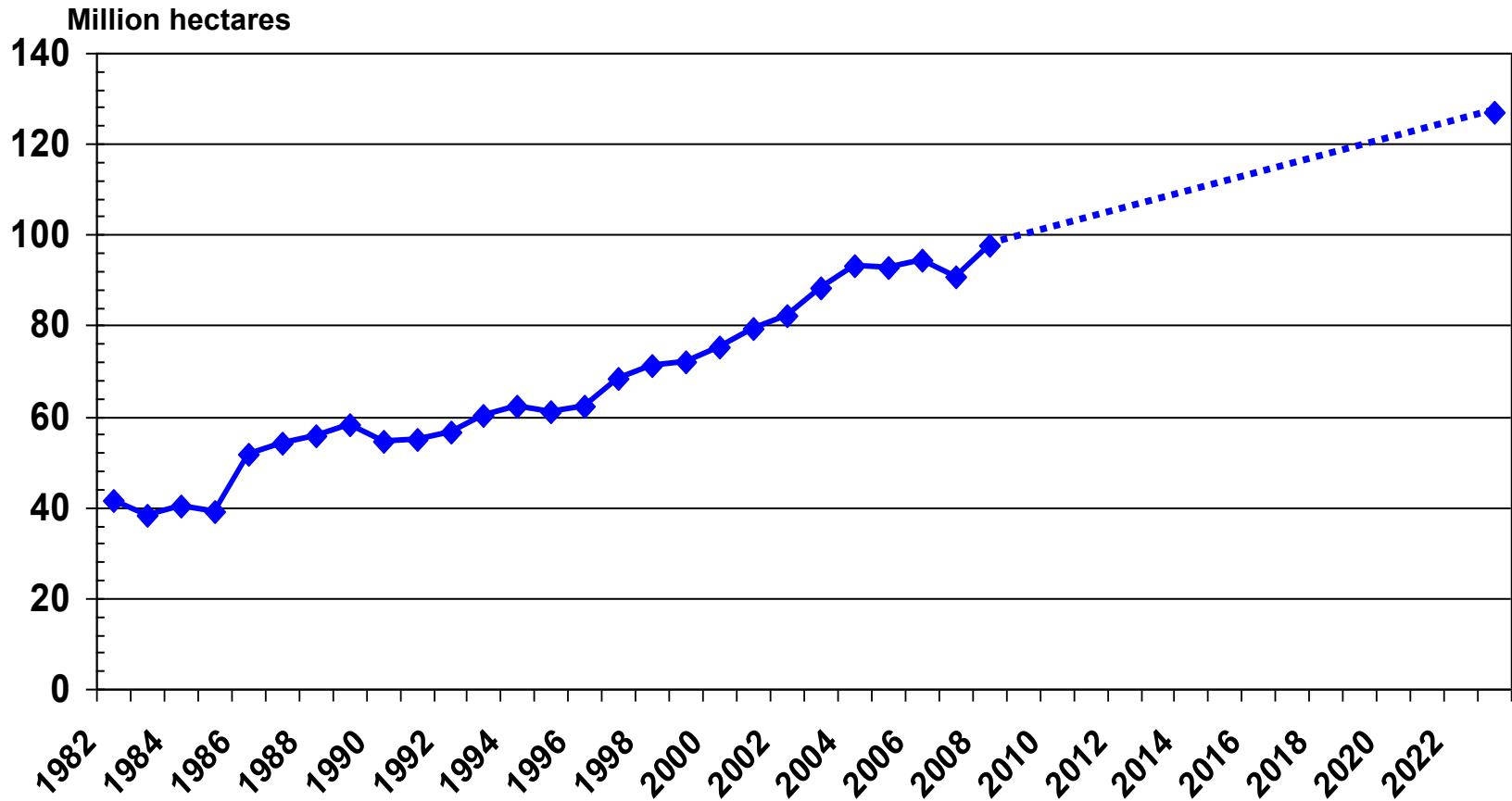


Soybean Deficit with No Change in Acreage

million tonnes

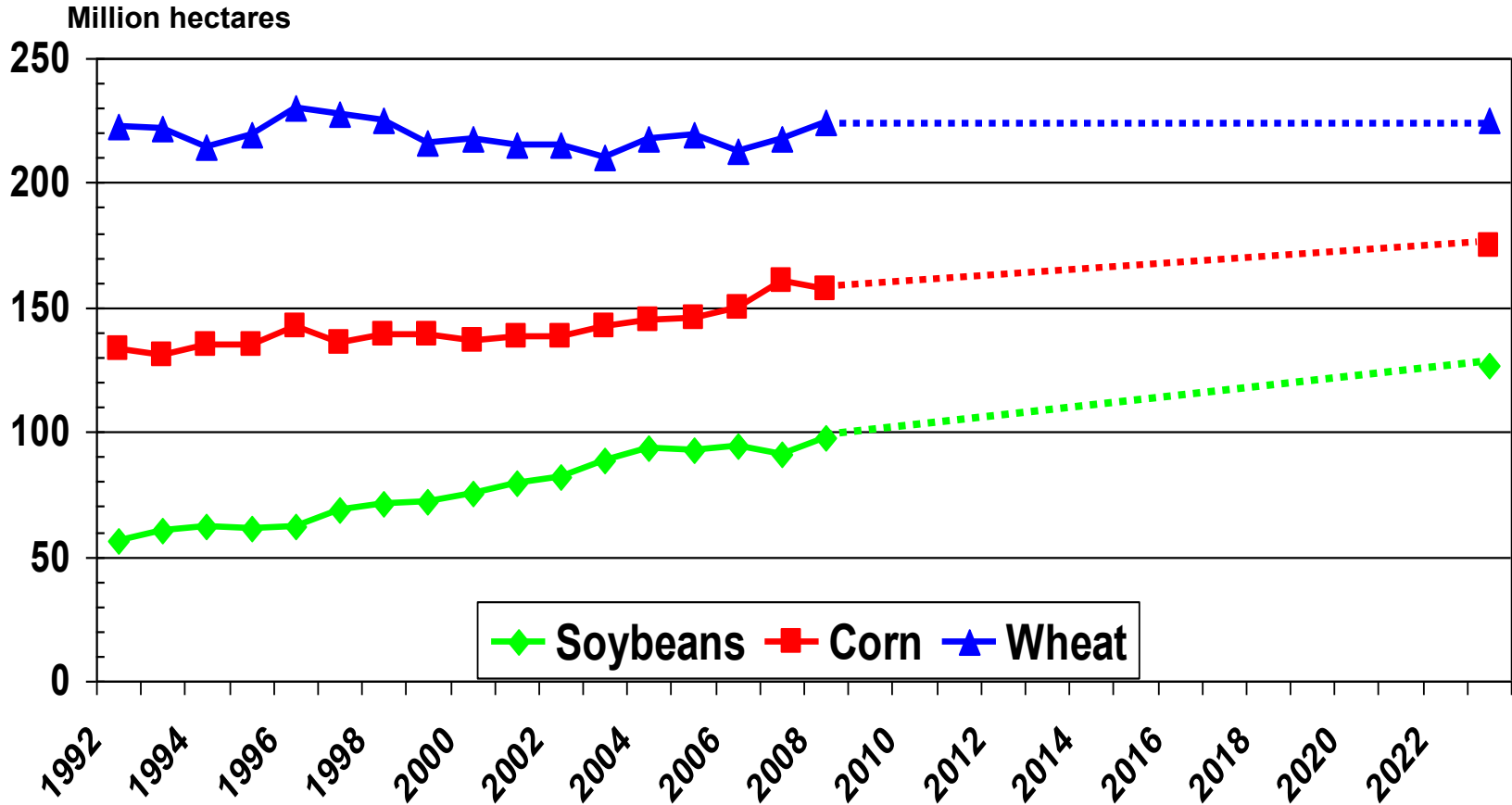
| | Africa | Middle east | China |
|-----------------|--------|-------------|-------|
| Deficit in 2008 | 1.7 | 3.5 | 35.3 |
| Deficit in 2023 | 4.3 | 7.0 | 79.3 |

World Soybean Area



An increase of 72 million acres

World Corn, Wheat & Soybean Area



Total Increase = 50 million hectares (120 million acres)

Conclusions

- World grain and soybean demand will rise significantly by 2023
- Current yield growth is not enough to keep pace with rising demand
- Crop production area will probably need to increase
- Area expansion may be difficult in areas where demand growth is strong

Questions??