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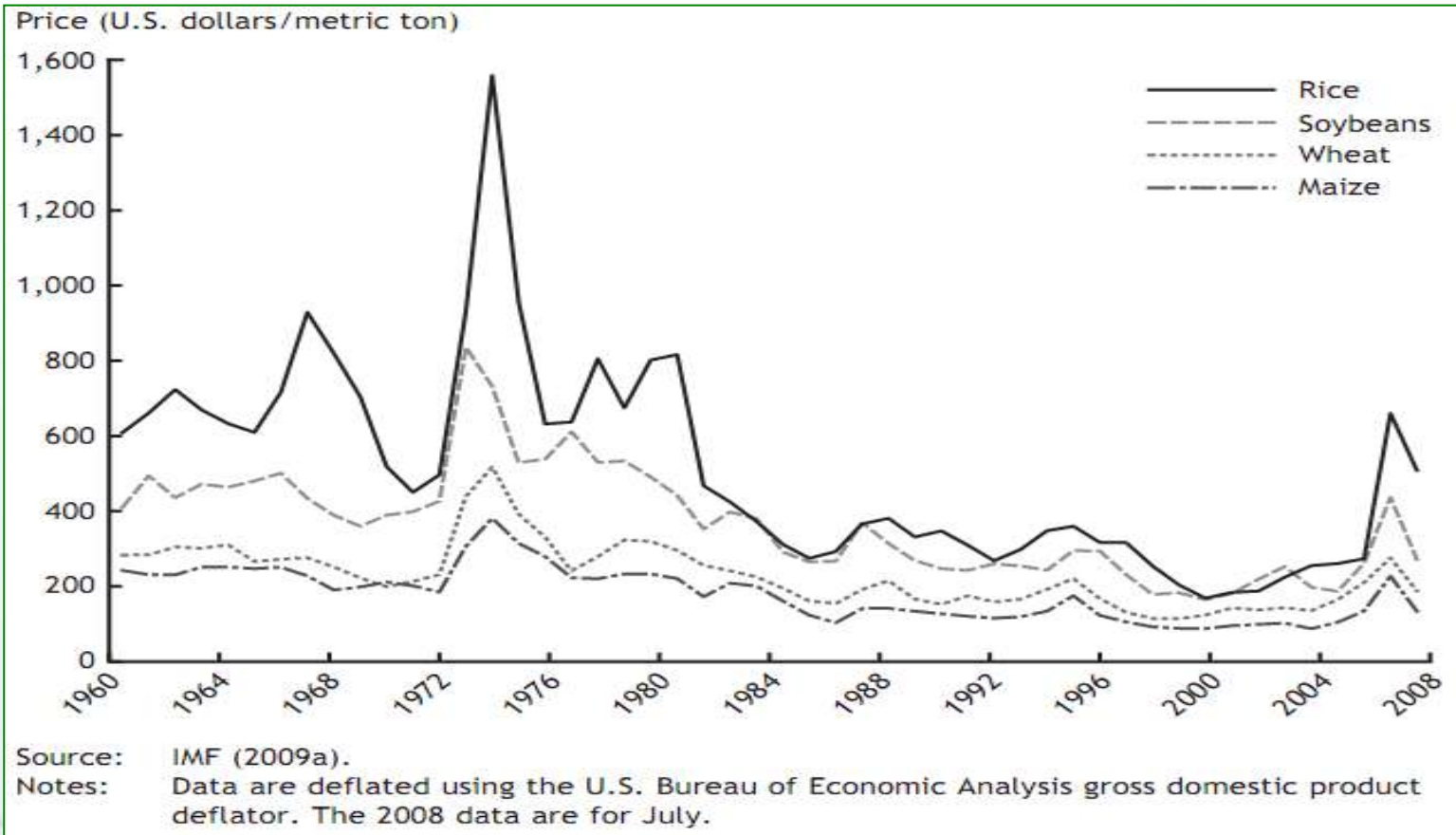
**What are the Effects of Biofuels and  
Bioproducts on Environment, Crop  
and Food Prices and World Hunger?  
([www.gfo.ca](http://www.gfo.ca))**



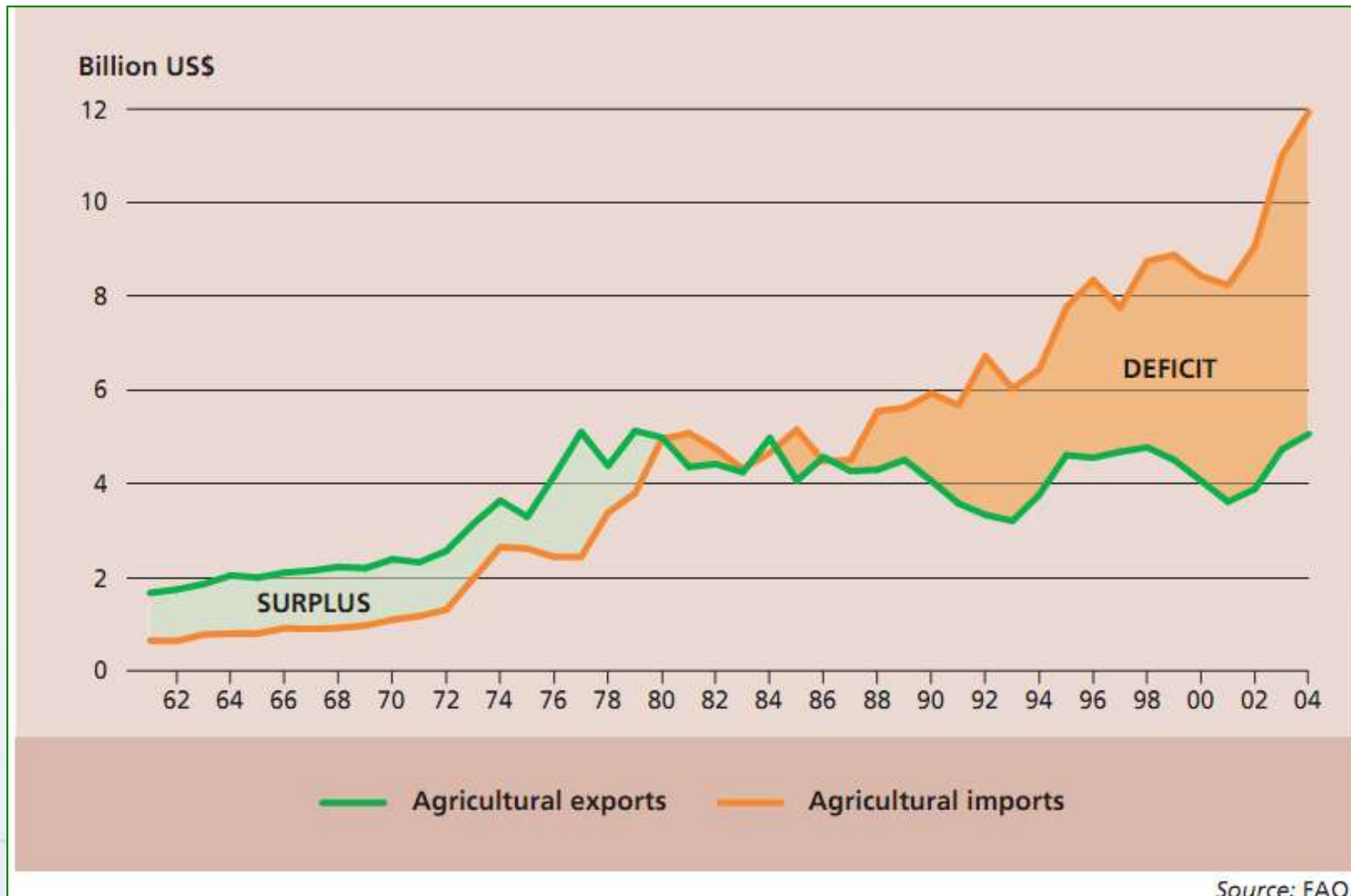
# An Historical Perspective - Grains

- Grain supply/price crisis of 1970s
  - World gears up for expanded production
  - Low grain prices and farm incomes follow
  - Land set-aside schemes; grain subsidy wars; low-cost exports; trade agreements
  - Depressive effect on agriculture, especially in developing countries
  - World ignores agriculture for 25 years
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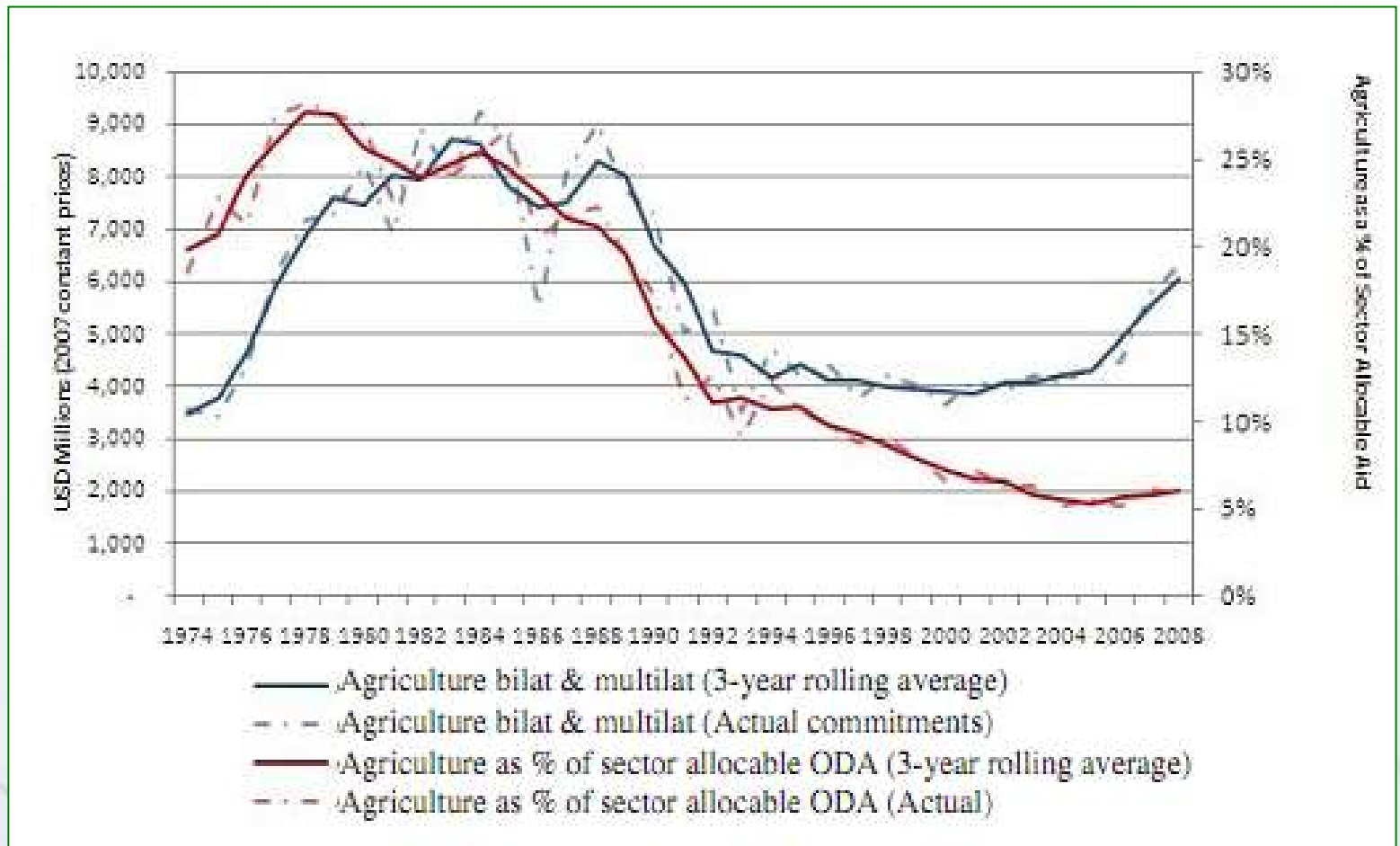
# Changes in Real Grain Prices since 1960



# Agricultural Trade Balance - Least Developed Countries

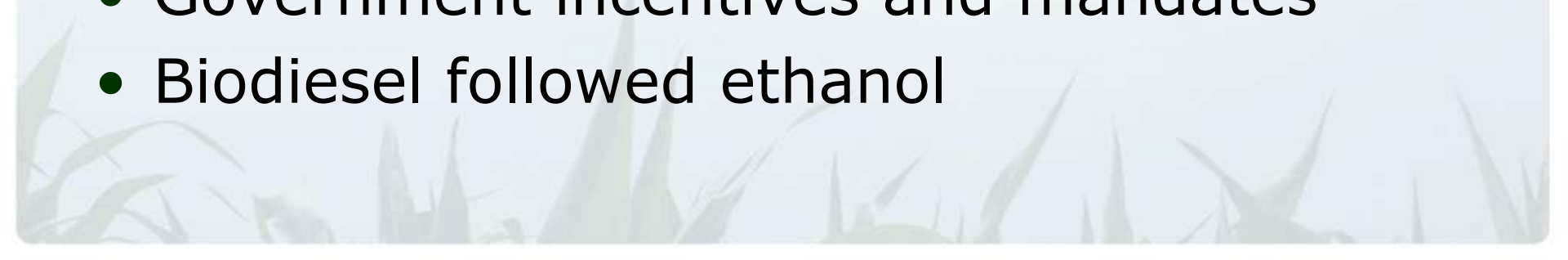


# Decline in Funding for International Development





# Why Biofuels?

- Increased oil prices and supply concerns; desire for increased domestic fuel supply
  - New market for grains and sugar; rural/agricultural economic development
  - Octane supply; ethanol -115 octane rating
  - Growing concerns about Greenhouse Gas (GHG) Emissions
  - Government incentives and mandates
  - Biodiesel followed ethanol
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# Global Biofuels

## 100 billion litres of ethanol

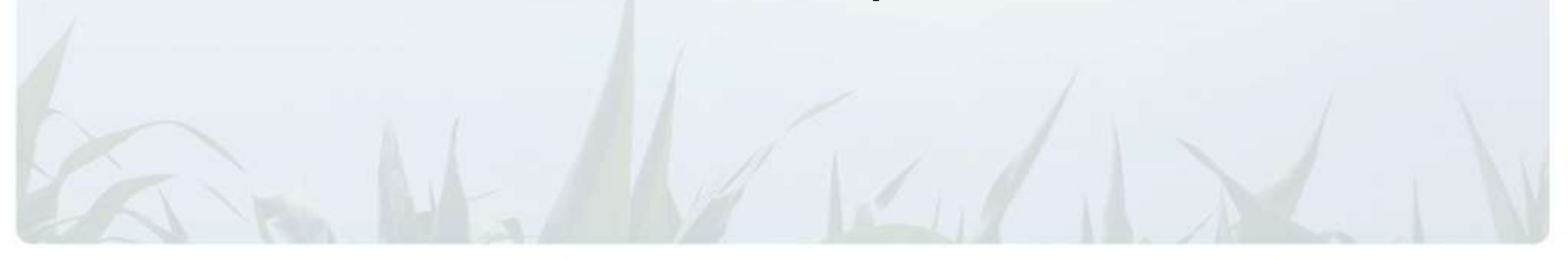
- About 5% of global gasoline supply
- 60+% in US (125 million tonnes corn)
- Brazil (sugar cane) and EU (wheat and sugar beets) and also in China, India, Canada, Australia, many other countries
- 15% of world's corn; 5.7% of grain (3.7% with byproduct credit).

## 11 billion litres of biodiesel

- Less than 1% of global diesel supply
- 75% in EU (rapeseed)
- US, Brazil and Argentina (soybeans), and many other countries
- 10% of global vegetable oils.



# Public attitudes turn negative

- Grain price spikes in 2007/08 and 2010/2011 trigger search for villains
  - Biofuels blamed, especially ethanol
  - Environmental benefits are now questioned severely
  - This is why the Grain Farmers of Ontario commissioned our study – what is the truth?
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# Environmental Benefits Canadian Analyses

- The addition of 10% ethanol to gasoline means a 62% reduction in net GHG emissions on a per litre of ethanol basis, adjusted for energy content
- Ethanol has 1.6 times as much combustible energy as is used in its production – projected to exceed 2.0 by 2015
- Biodiesel is substantially higher in both ratios
- Canadian fuel ethanol usage equivalent to removing 440,000 cars from the road (equates to about 18 million cars, globally).

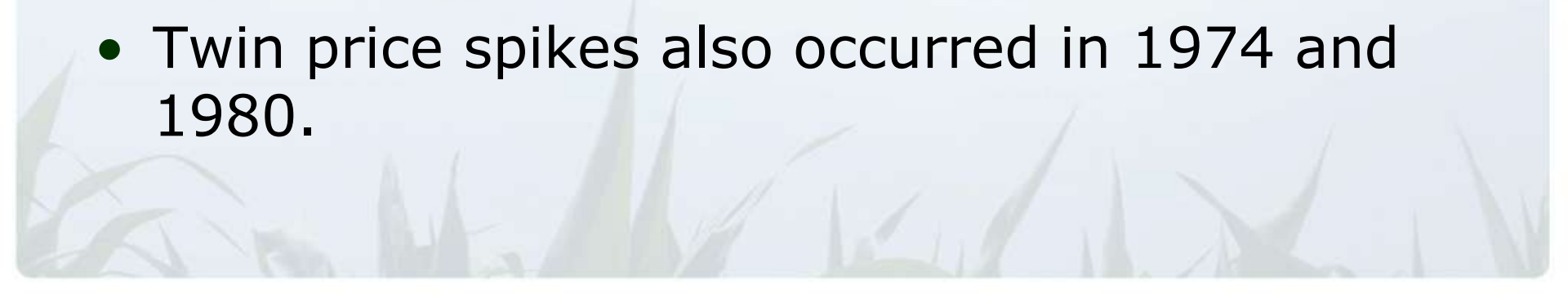


# Causes of 2007-2008 Price Spike

- Poor wheat crops in parts of Europe and elsewhere (though total global production up)
  - Export restrictions for wheat and rice
  - Panic buying/hoarding
  - Thin rice export market, world price up 225%
  - Possible effect of commodity futures traders
  - High oil prices – cost of production and transport
  - Shrinking US dollar (spikes less in other currencies).
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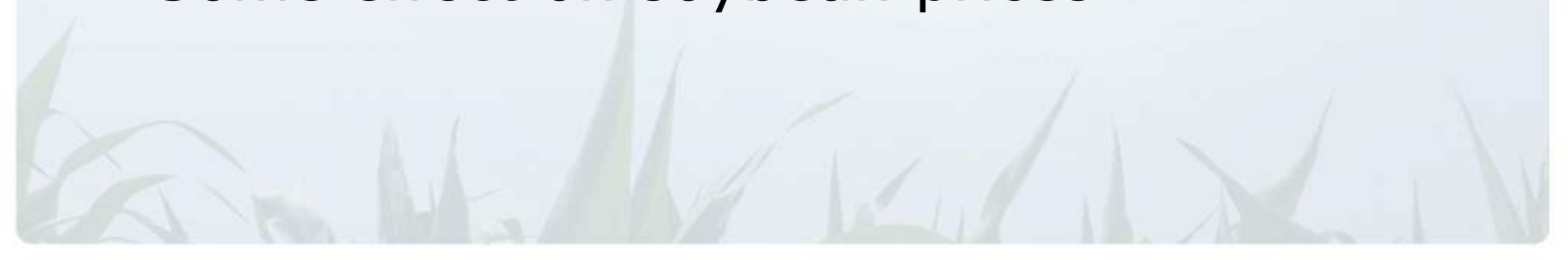


# 2010-2011 Price Spikes

- Small wheat crops in some countries in 2010, especially Eastern Europe
  - Export restrictions and increased buying by North African countries
  - Disappointing US corn and soybean crops
  - Small or no rice price spike this time
  - Price spikes less dramatic in non-US currencies
  - Twin price spikes also occurred in 1974 and 1980.
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# Effect of Biofuels on Grain Prices

- Greatest effect on corn price but minor or no effect on other crops
  - Estimates of percent biofuel effect on corn price spike range from near zero to over 70%
  - Best estimate is 20-40% of North American corn price spike
  - Some effect on soybean prices.
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# Effects on Food Prices

- US Congressional Budget Office:  
Biofuels responsible for 0.5 to 0.8%  
of 5.1% food price increase in 2008
  - Energy price increase far more  
important
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# Canadian Food Expenditures

- “Food Freedom Day” is February 12 (Canadian Federation of Agriculture)
- Twenty percent (or less) of food dollars go to farmers
- “Farmer Food Freedom Time” is January 9 at about noon
- When corn prices peaked in June 2008, “ethanol effect” might have delayed Farmer Food Freedom Time to January 9 at 4 PM.


# Ethanol & Gasoline Prices

- Gasoline supply-price elasticity is about minus 0.50
- 5% increased supply should mean 10% price reduction
- Retail effect may be minus 6-10 cents/litre
- CARD-Iowa State University analyses:
  - 2008 report – 6 ¢/litre average US reduction, 10¢ in Midwest
  - 2010 report – 23 ¢/litre average US reduction


The background of the slide features a blurred image of a cornfield with green stalks and yellow tassels. The top portion of the slide has a light blue gradient with a black and green wavy border.

# Effects of fuel ethanol on Canadian Families

- 0.5-0.8% increase in food prices means about \$35-60 more per year
- 6-10 cents/litre reduction in gasoline price means about \$100 to 180 less per year.

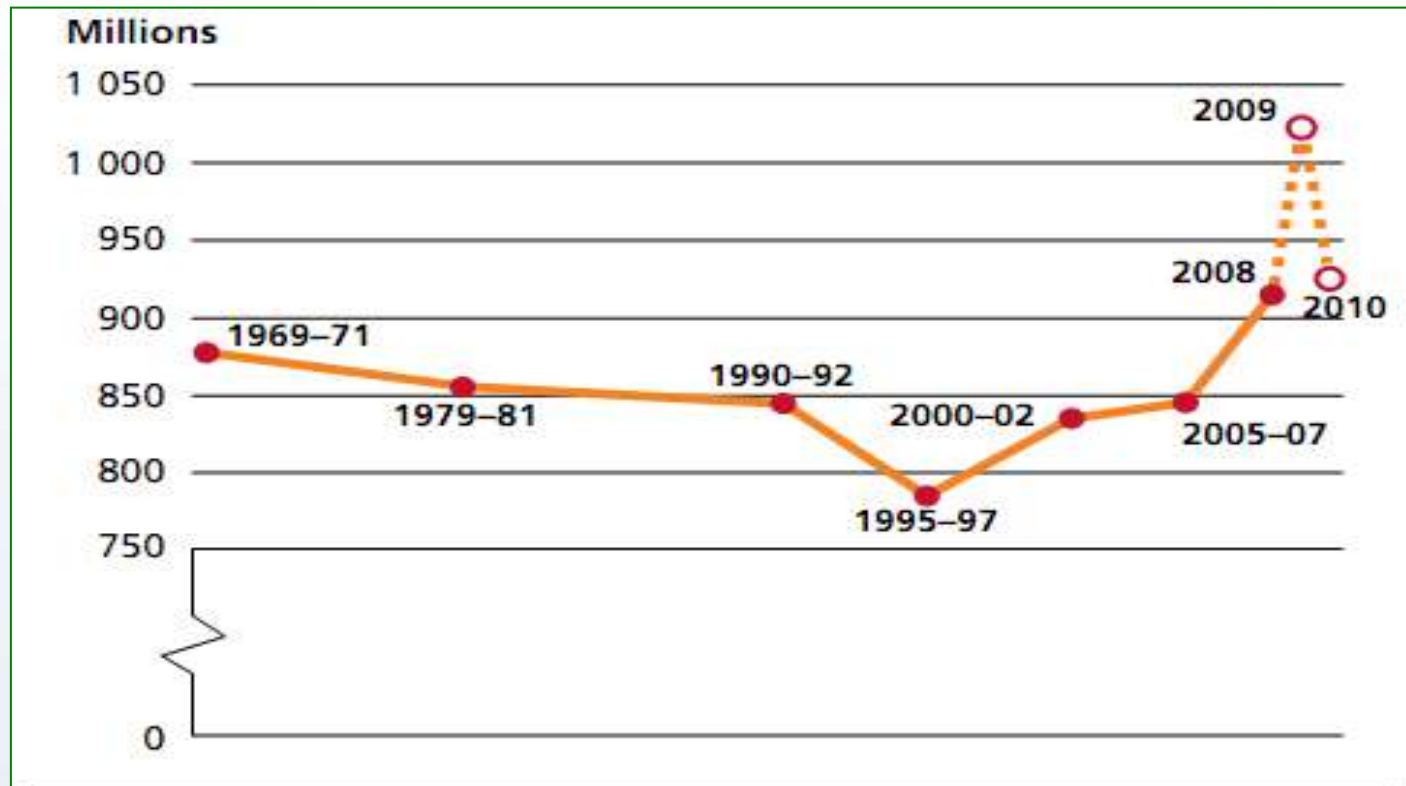


# Larger Food Issues

- 40% of food wasted in North America
  - Nearly 50% of Canadians over-weight or obese
  - Similar patterns for much of the developed world
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# Global Hunger

## Number of Under-Nourished



Note: Figures for 2009 and 2010 are estimated by FAO with input from the United States Department of Agriculture, Economic Research Service. Full details of the methodology are provided in the technical background notes (available at [www.fao.org/publication/sofi/en/](http://www.fao.org/publication/sofi/en/)).

Source: FAO.

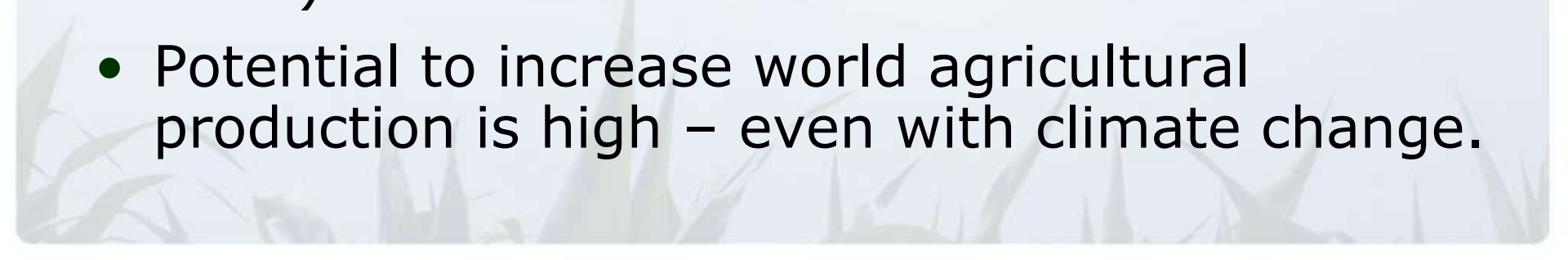
The background of the slide features a blurred image of a cornfield with green stalks and leaves. A light blue curved banner is positioned at the top, containing the title text. A decorative green and black wavy line separates the banner from the main content area.

## Minimal Biofuel Effect on Third-World Food Prices & Hunger

- Local food prices well insulated from global prices; most hunger is in isolated rural communities
- Export restrictions, panic buying & hoarding, oil prices far more important
- Rice and wheat far more important than corn
- Domestic white corn pricing is usually distinct from that for imported yellow corn
- Many developed countries also have obesity problems
- 25-50% global grain/food spoilage/wastage.




# Future Expectations

- Are higher prices here to stay? Or is there something different?
  - Learn from 1970s' experience – higher prices and concern about future food supply, followed by ample production and low prices
  - 1.1% annual increment needed to increase world food supply by 70% from 2000-2050 (vs. average grain yield increase of 1.5%/year since 1980)
  - Potential to increase world agricultural production is high – even with climate change.
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# Potential to Produce

- “Analysts have consistently underestimated the capacity of producers to respond to positive market signals, as well as the potential for higher yields and increased acreage” (June 2011 policy report by FAO, in cooperation with the IMF, OECD, WFP, World Bank, the WTO, IFPRI)
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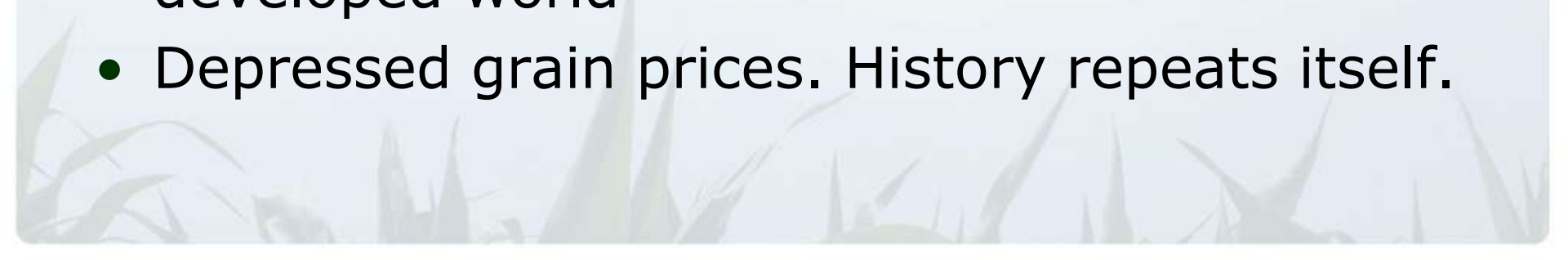
# Addressing World Hunger

- USDA-ERS analysis: food caloric deficit in 70 hungriest countries equates to 1.1% of annual world grain production
- Three decades of shipping cheap, subsidized North American grain to the Third World, while also ignoring and under-mining third-world agriculture, has provided no solution to global hunger.
- “We need to produce where the poor and hungry live,” Dr. Jacques Diouff, director-general, Food and Agricultural Organization

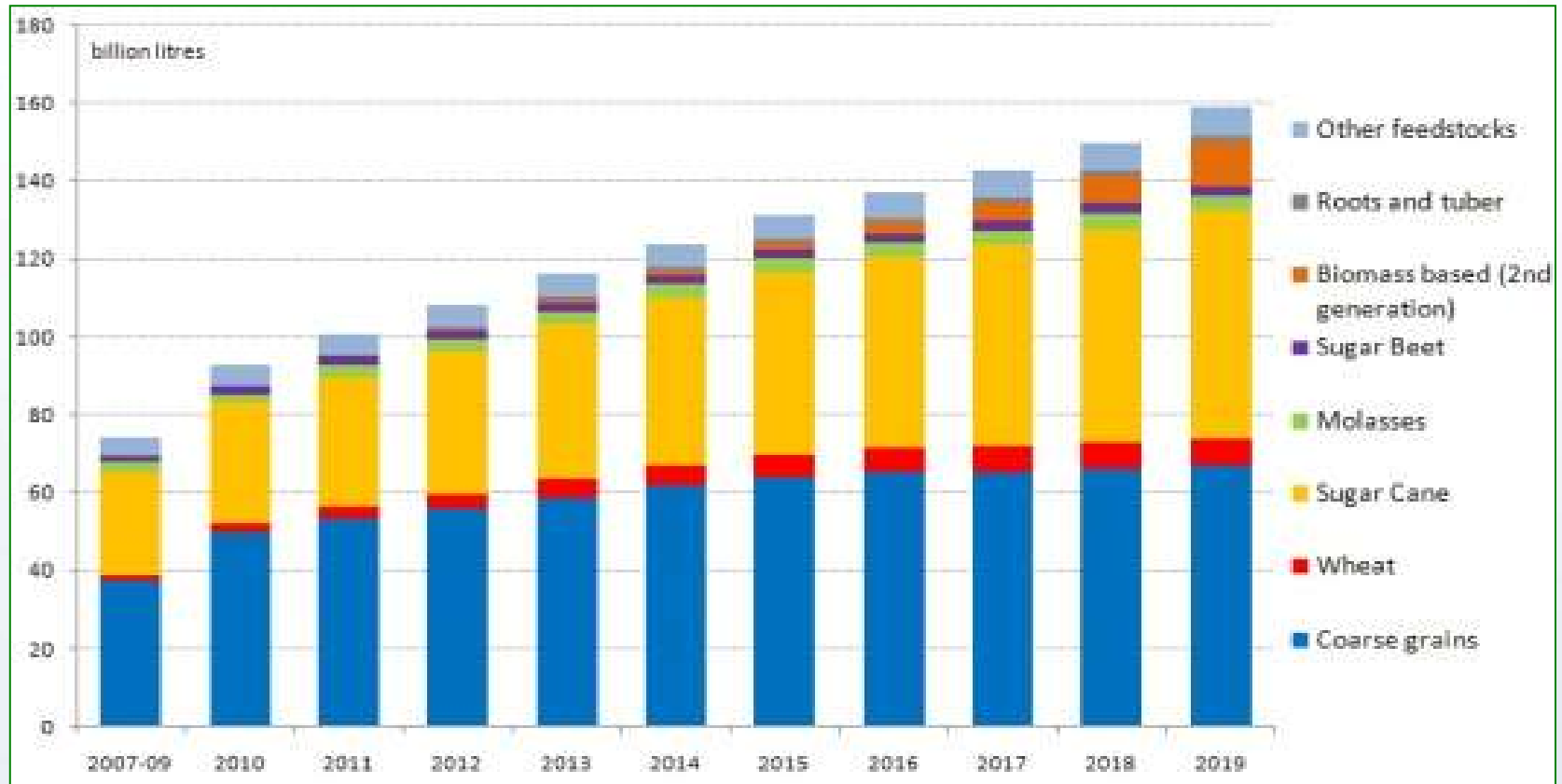


# Implications for Canadian Grain Farmers

## We could see:

- Much greater food productivity/self-sufficiency in developing countries
  - Slow or no growth in food consumption in developed world
  - Slower expansion in ethanol production from grain, though greater percent increase in biodiesel
  - Continuous increases in farm productivity in developed world
  - Depressed grain prices. History repeats itself.
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# World Fuel Ethanol Projections



Source: OECD and FAO, 2010


# Bioproducts

- Bioplastics/composites, coatings, adhesives, lubricants, related materials
- Total global production ~ \$1-2 billion/year
- Less than 5% of current feedstock is used for biofuels, but large potential
- Estimated \$6 billion by 2010, \$20 billion by 2020
- World plastic market is 500,000 tonnes per year (~\$1 trillion)
- One of best opportunities for Canadian agriculture.

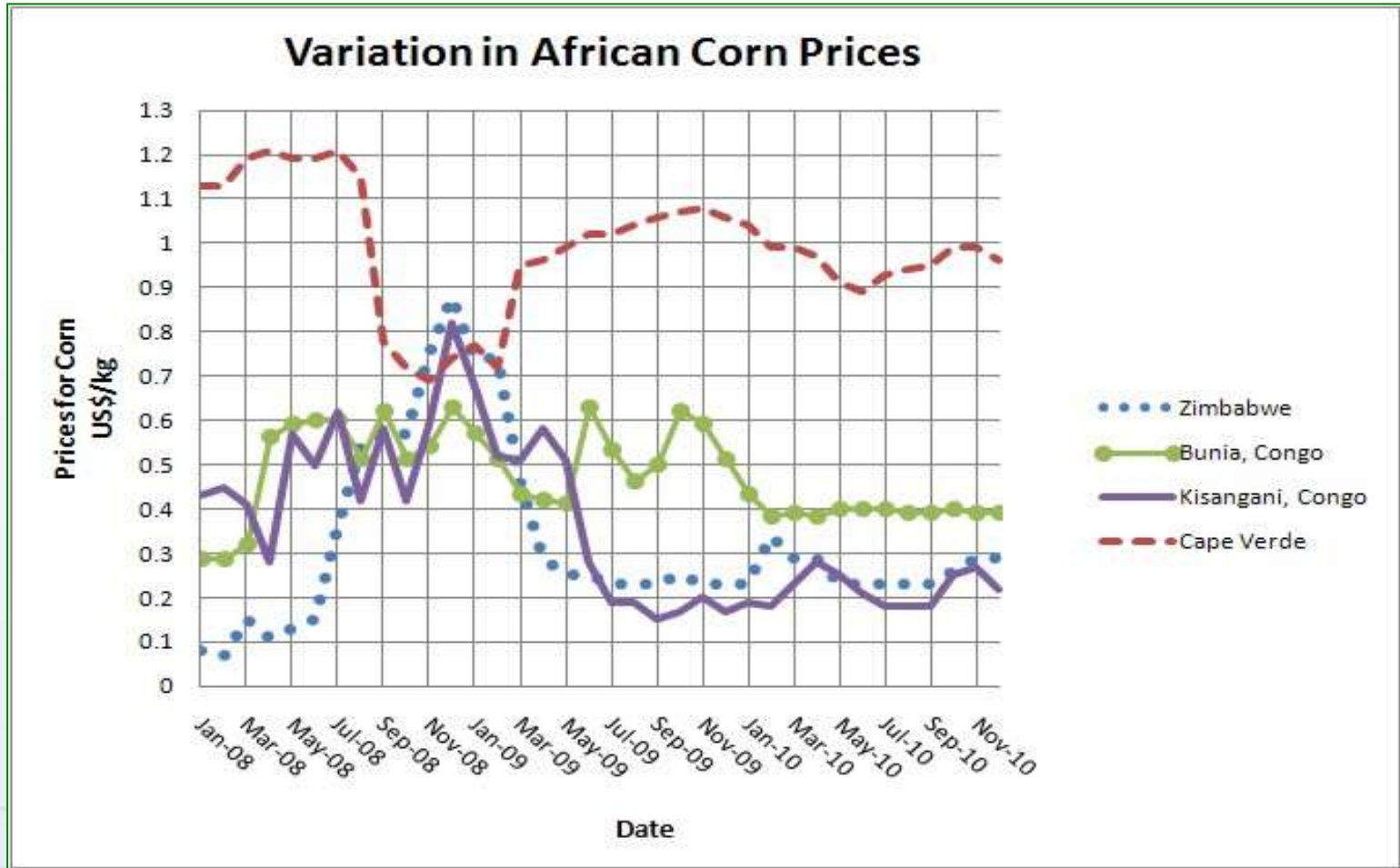


# That's it Thank you

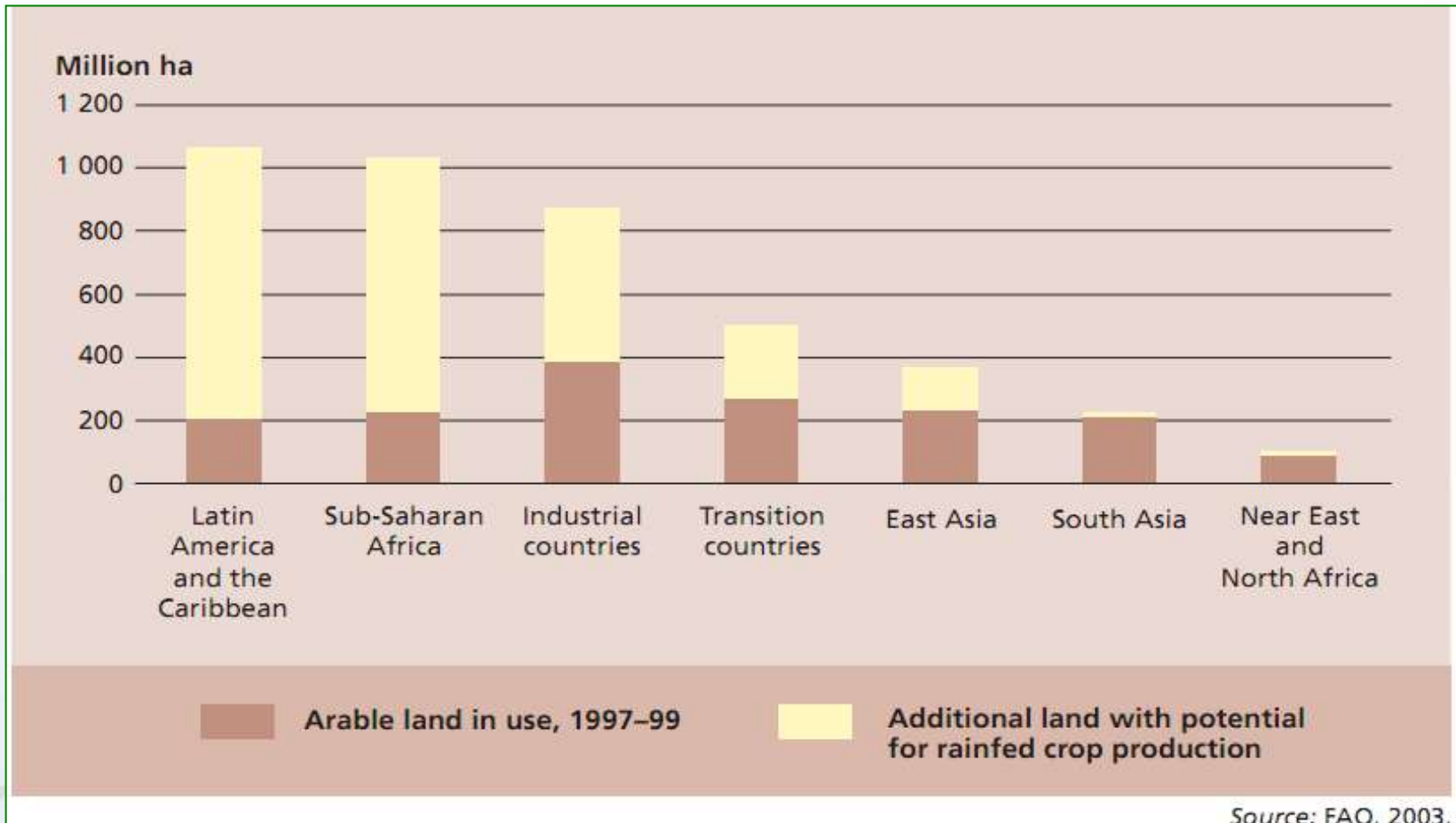
(Thanks to Karen Daynard, co-author of report, and to the Grain Farmers of Ontario for funding)



# 2008-2010 Corn Prices in Africa



# Potential for Cropland Expansion



Source: FAO, 2003.