

Resetting U.S. Climate Policy



12TH International Conference on Climate Change
March 23 -24, 2017 ☀ Washington, DC

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Founder and Former President
CO2 Science



**Panel 2A: FOSSIL FUELS
& HUMAN PROSPERITY**

Direct Monetary Benefits of Rising Atmospheric CO₂ on Global Food Production



12th International Conference on Climate Change

Dr. Craig D. Idso, Chairman
Center for the Study of Carbon Dioxide and Global Change
www.co2science.org

Higher CO₂ Concentrations Increase Plant Productivity

- Atmospheric CO₂ is the basic food of plants
 - It is the primary raw material utilized by plants to construct their tissues
- Plants love CO₂
 - Thousands of laboratory and field experiments have demonstrated that higher atmospheric CO₂ concentrations increase plant productivity

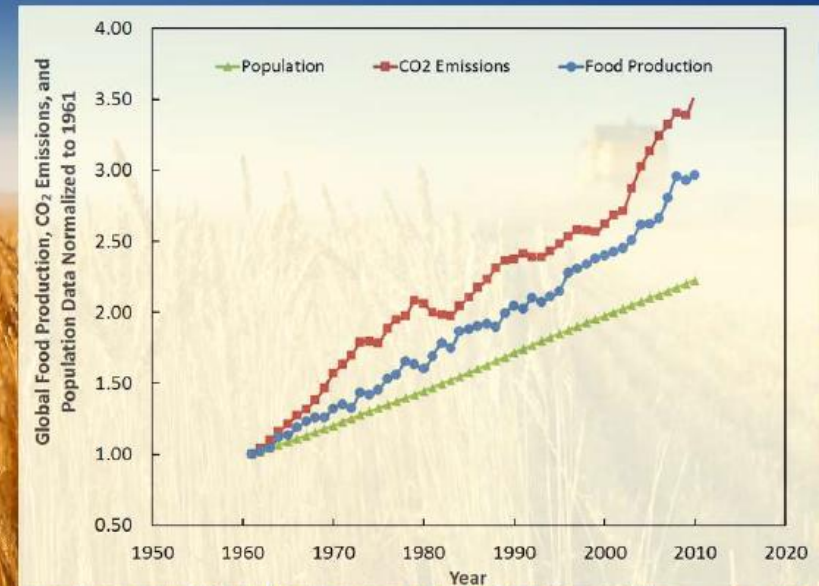
“The ‘green revolution’ has coincided with the period of recorded rapid increase in concentration of atmospheric carbon dioxide, and it seems likely that some credit for the improved [crop] yields should be laid at the door of the CO₂ buildup.”

— Dr. Sylvan H. Wittwer (1982)

The first comprehensive analysis to explore the impact of rising atmospheric CO₂ on past (and future!) crop yields

The Positive Externalities of Carbon Dioxide:

Estimating the Monetary Benefits of Rising Atmospheric CO₂ Concentrations on Global Food Production



Craig D. Idso, Ph.D.

Center for the Study of Carbon Dioxide and Global Change

18 October 2013

Data

- Agricultural yield and production data obtained from the Food and Agriculture Organization (FAO) of the United Nations
 - Covered data for 169 different crops over the period 1961-2011
- I limited my analysis to only the top 45 crops, which together amounted to a combined 95% of total global food production

Crop	% of Total Production	Crop	% of Total Production
Sugar cane	20.492	Rye	0.556
Wheat	10.072	Plantains	0.528
Maize	9.971	Yams	0.523
Rice, paddy	9.715	Groundnuts, with shell	0.518
Potatoes	6.154	Rapeseed	0.494
Sugar beet	5.335	Cucumbers and gherkins	0.492
Cassava	3.040	Mangoes, mangosteens, guavas	0.406
Barley	2.989	Sunflower seed	0.398
Vegetables fresh nes	2.901	Eggplants (aubergines)	0.340
Sweet potatoes	2.638	Beans, dry	0.331
Soybeans	2.349	Fruit Fresh Nes	0.321
Tomatoes	1.571	Carrots and turnips	0.320
Grapes	1.260	Other melons (inc.cantaloupes)	0.302
Sorghum	1.255	Chillies and peppers, green	0.274
Bananas	1.052	Tangerines, mandarins, clem.	0.264
Watermelons	0.950	Lettuce and chicory	0.262
Oranges	0.935	Pumpkins, squash and gourds	0.248
Cabbages and other brassicas	0.903	Pears	0.243
Apples	0.886	Olives	0.241
Coconuts	0.843	Pineapples	0.230
Oats	0.810	Fruit, tropical fresh nes	0.230
Onions, dry	0.731	Peas, dry	0.228
Millet	0.593		
Sum of All Crops = 95.2%			

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OCEAN ACIDIFICATION DATABASE



DO PLANTS LIKE MORE CO₂?



SEARCH BY TOPIC

ABCDEFGHIJKLMNOPQRSTUVWXYZ

Plant Growth Database

In this section of our web site we maintain an ever-expanding archive of the results of peer-reviewed scientific studies that report the growth responses of plants to atmospheric CO₂ enrichment. Results are tabulated according to two types of growth response (Dry Weight and Photosynthesis). To begin, click on the response you are interested in below.

[Dry Weight \(Biomass\)](#)

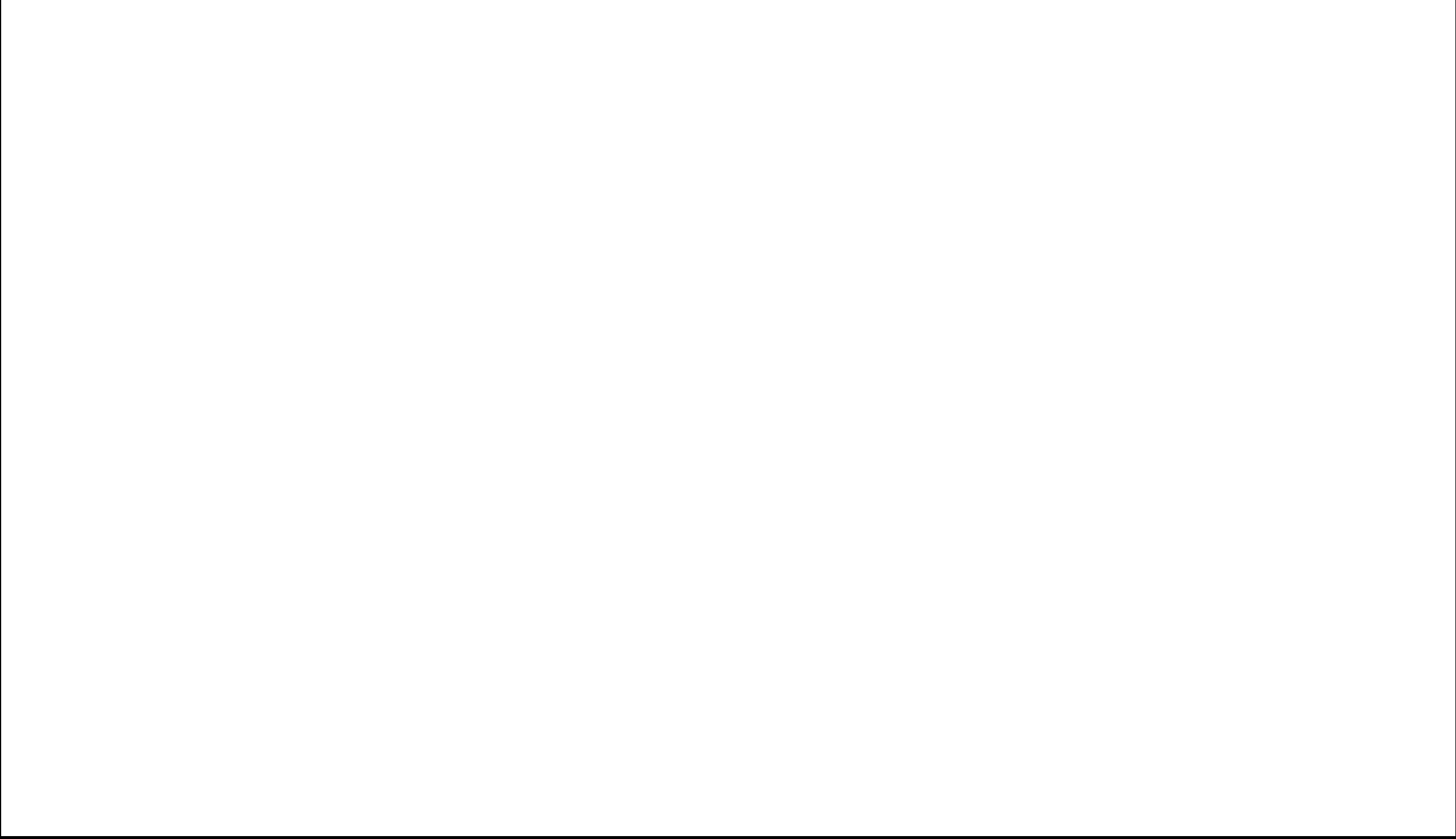
[Photosynthesis \(Net CO₂ Exchange Rate\)](#)

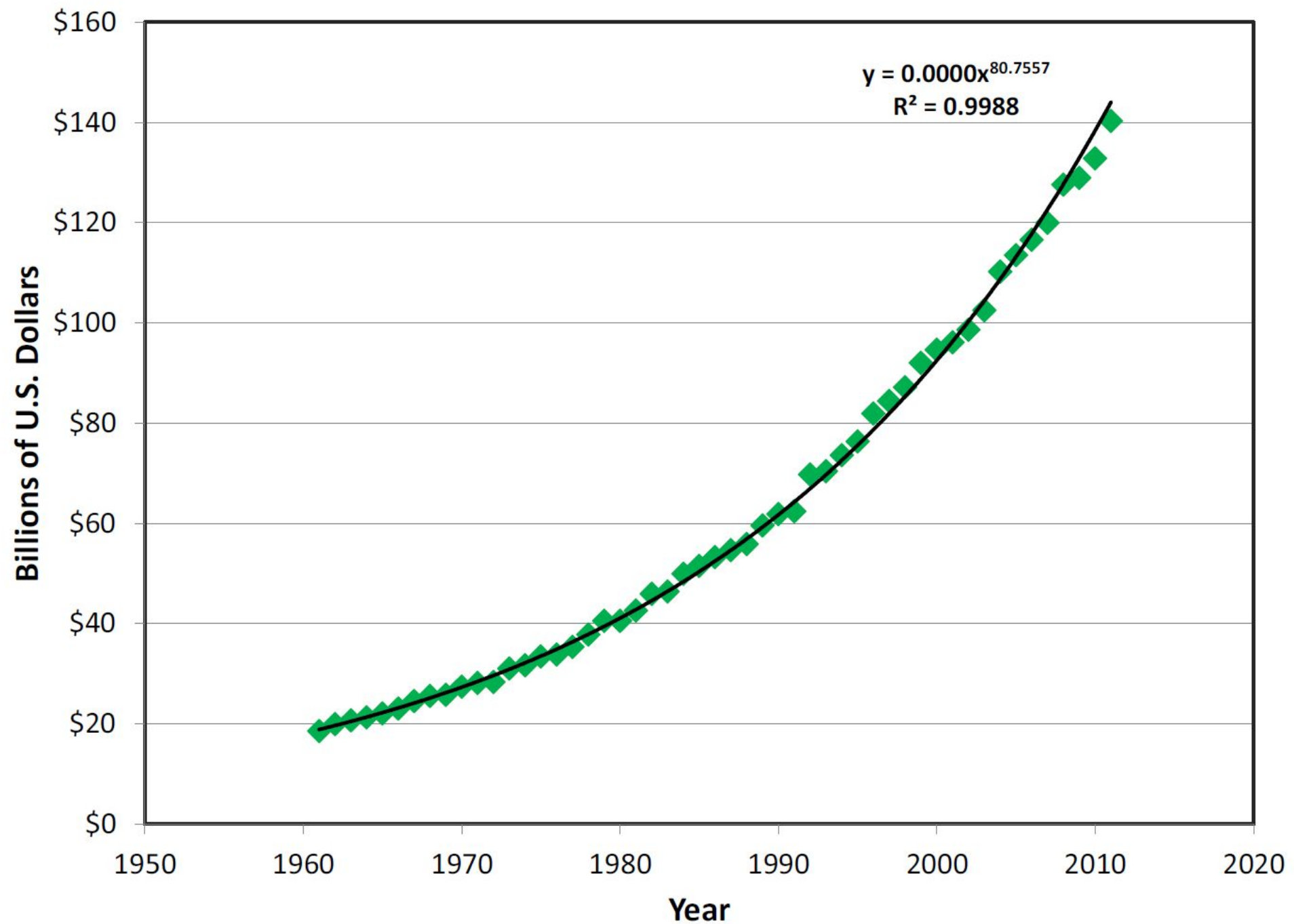


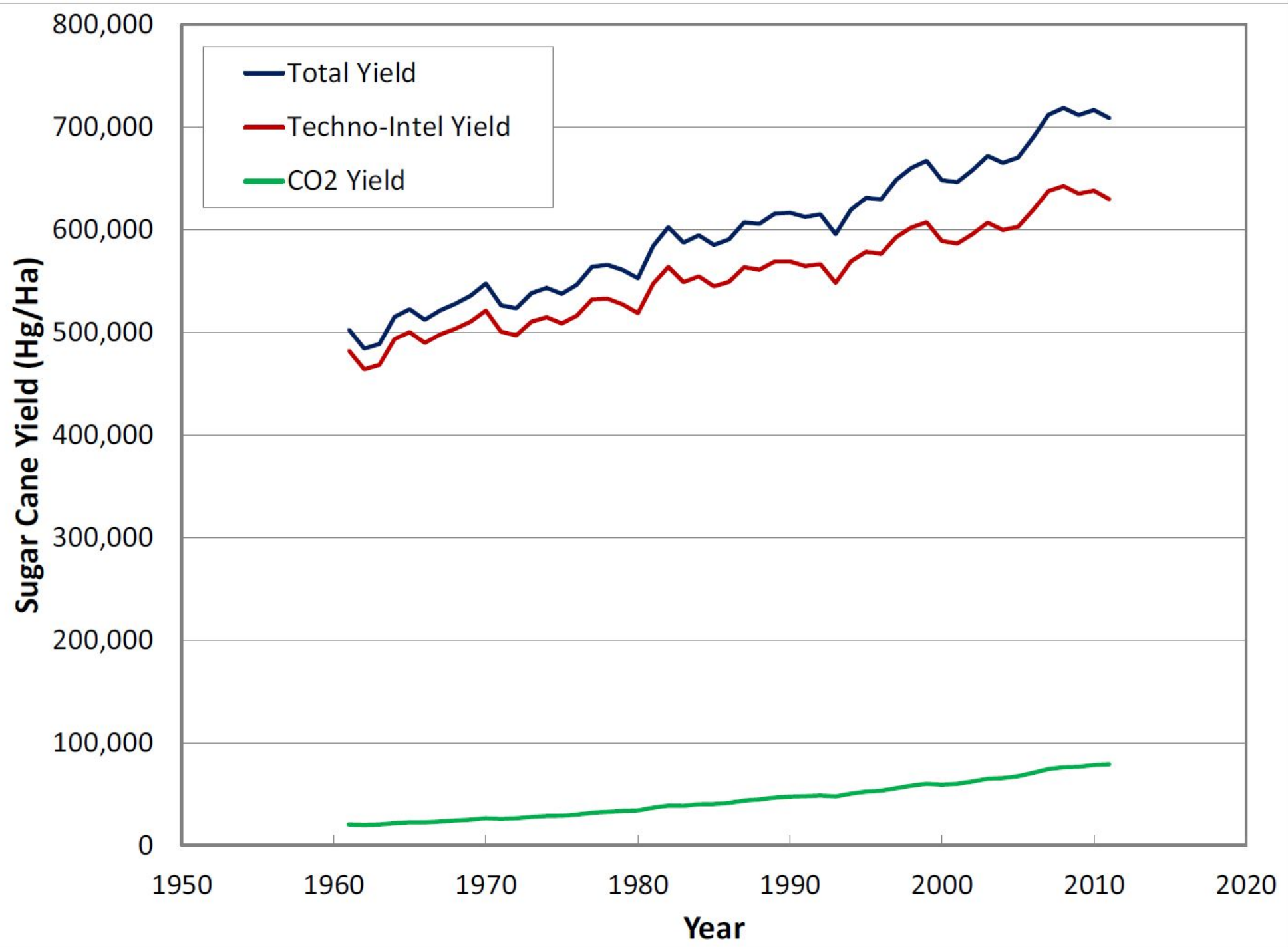
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Windows Taskbar

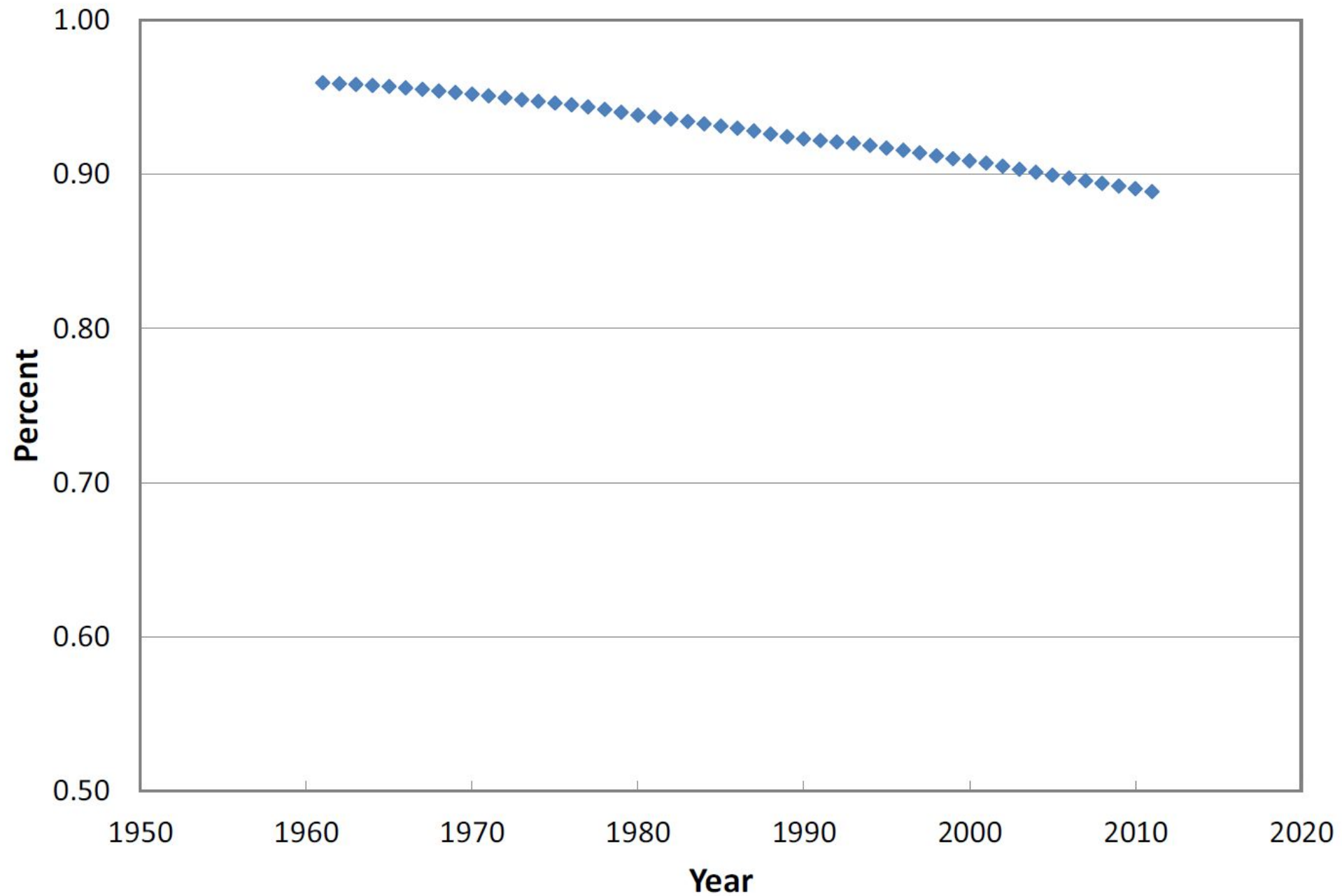
System Tray

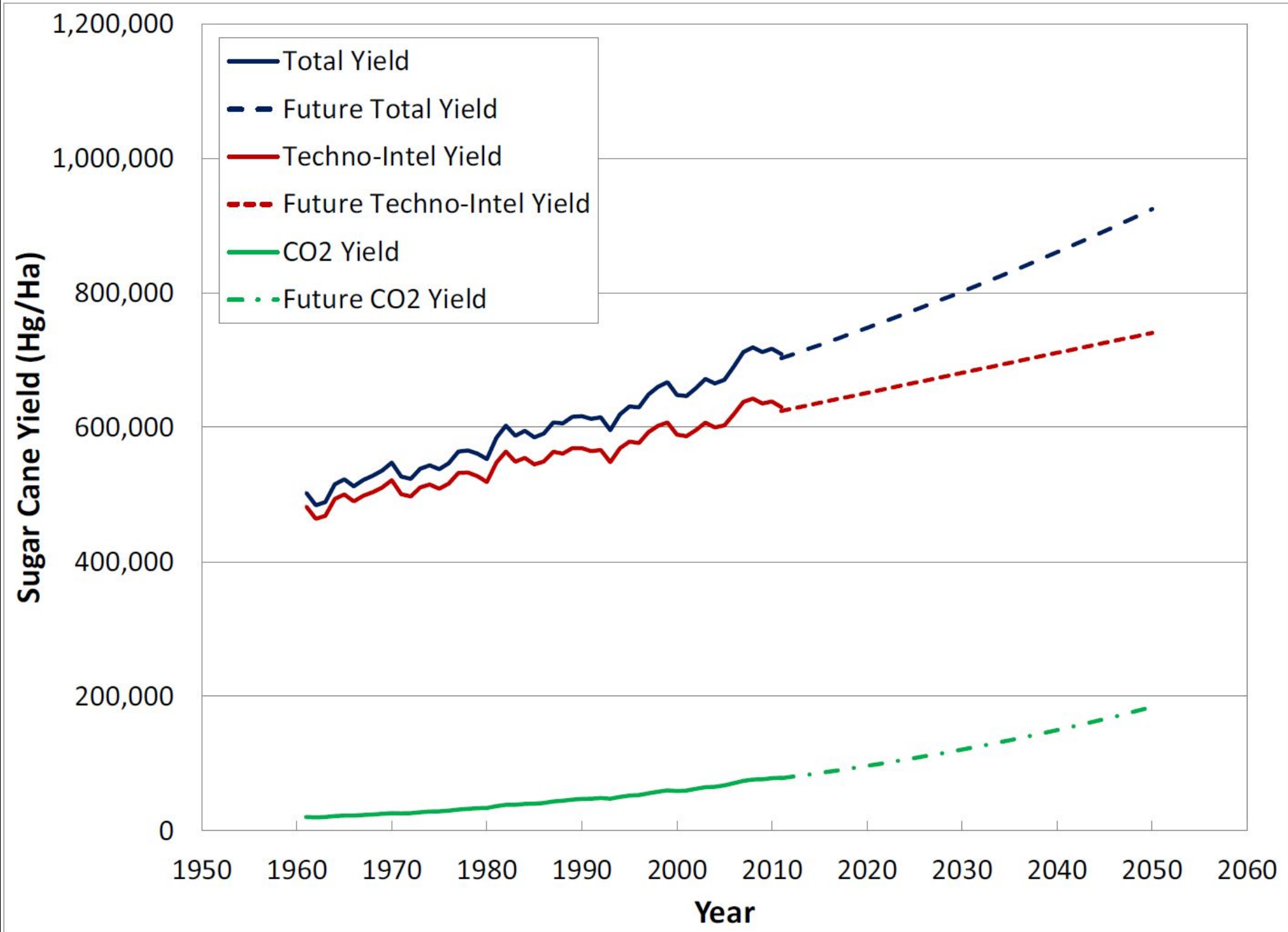




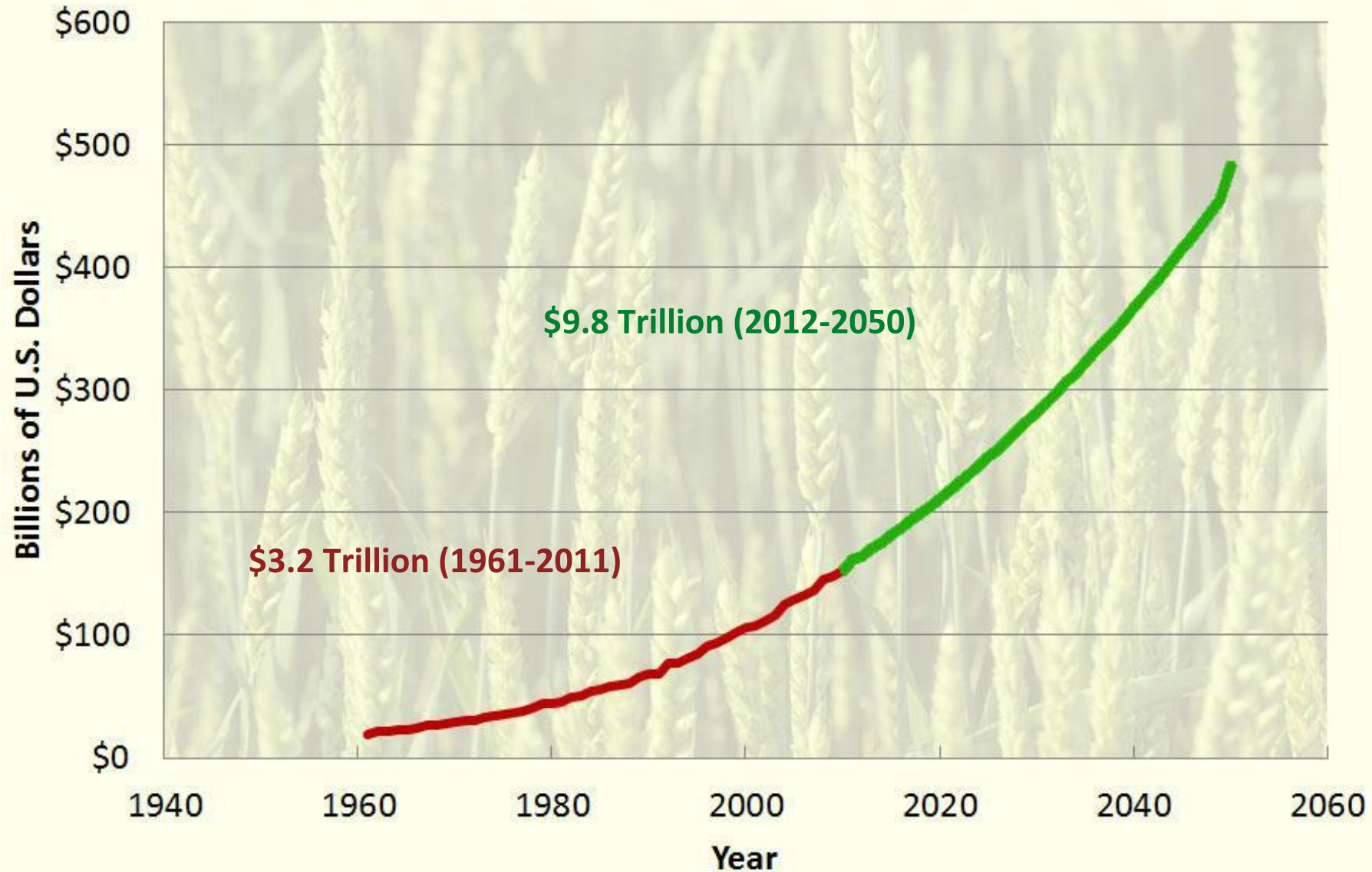


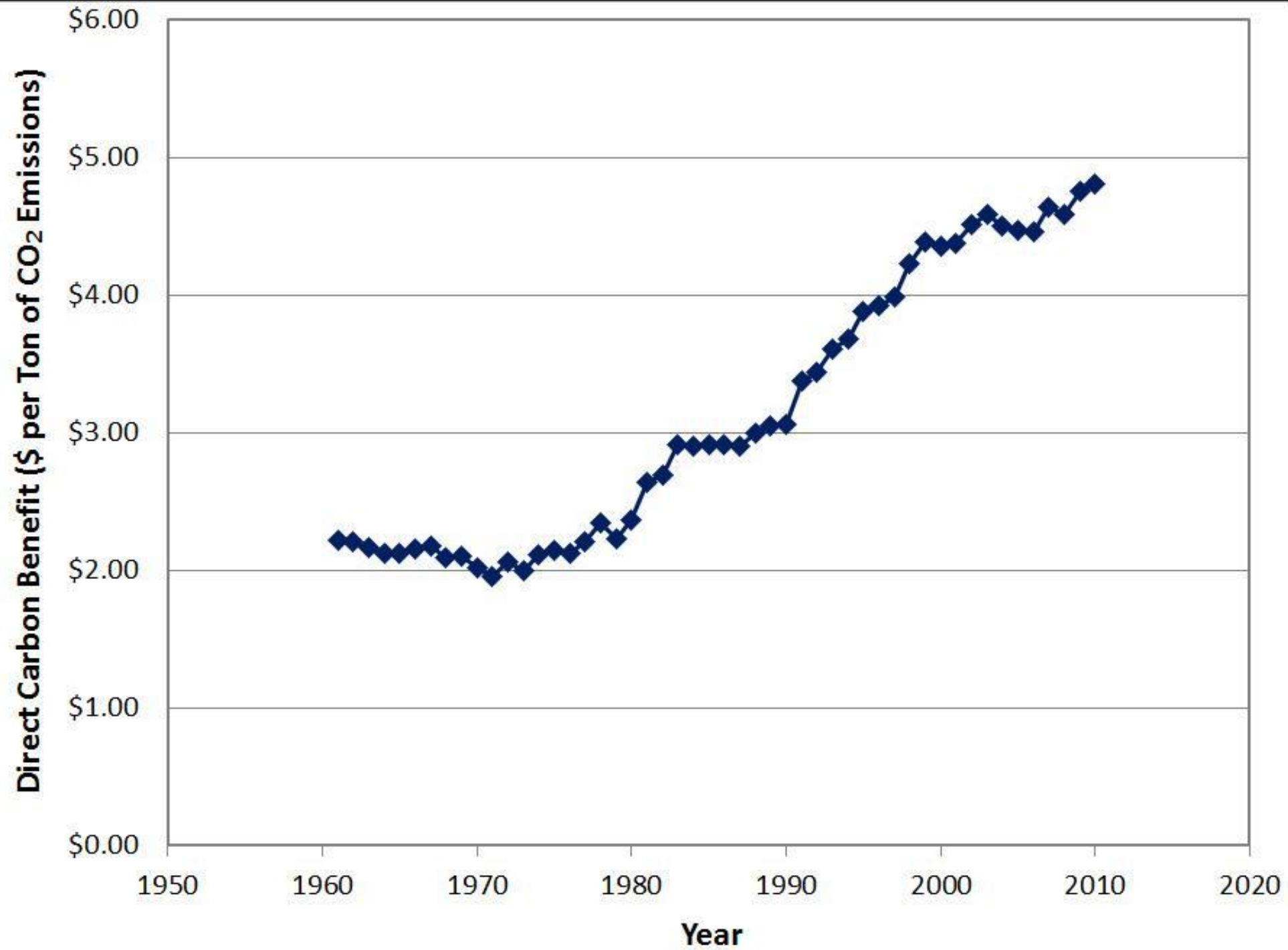
The Techno-Intel Effect as a Percent of Total Yield for Sugar Cane





Observed (1961-2011) and Projected (2012-2050) Monetary Benefit of Rising Atmospheric CO₂ on Global Crop Production

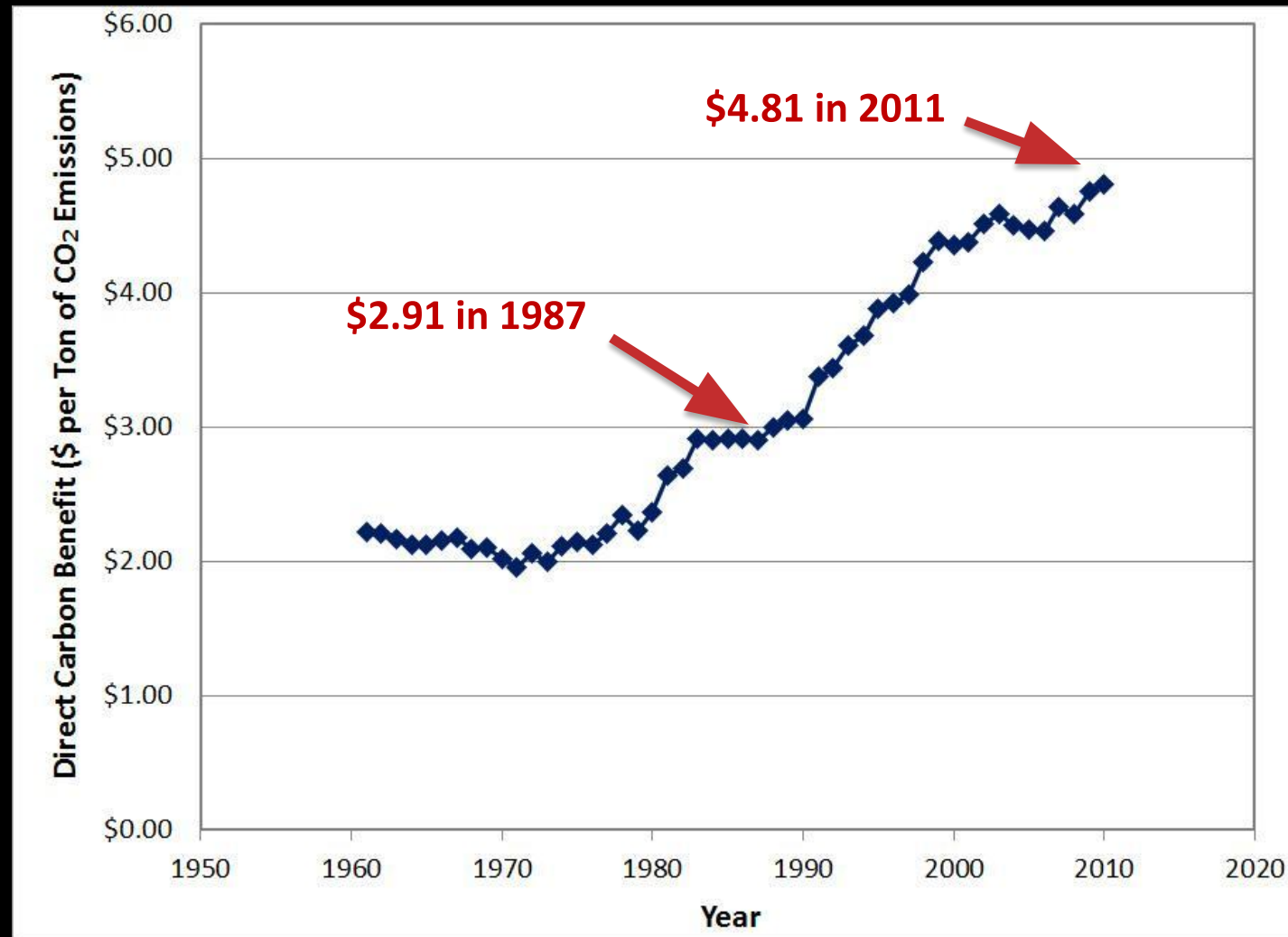




The Denialist Crowd

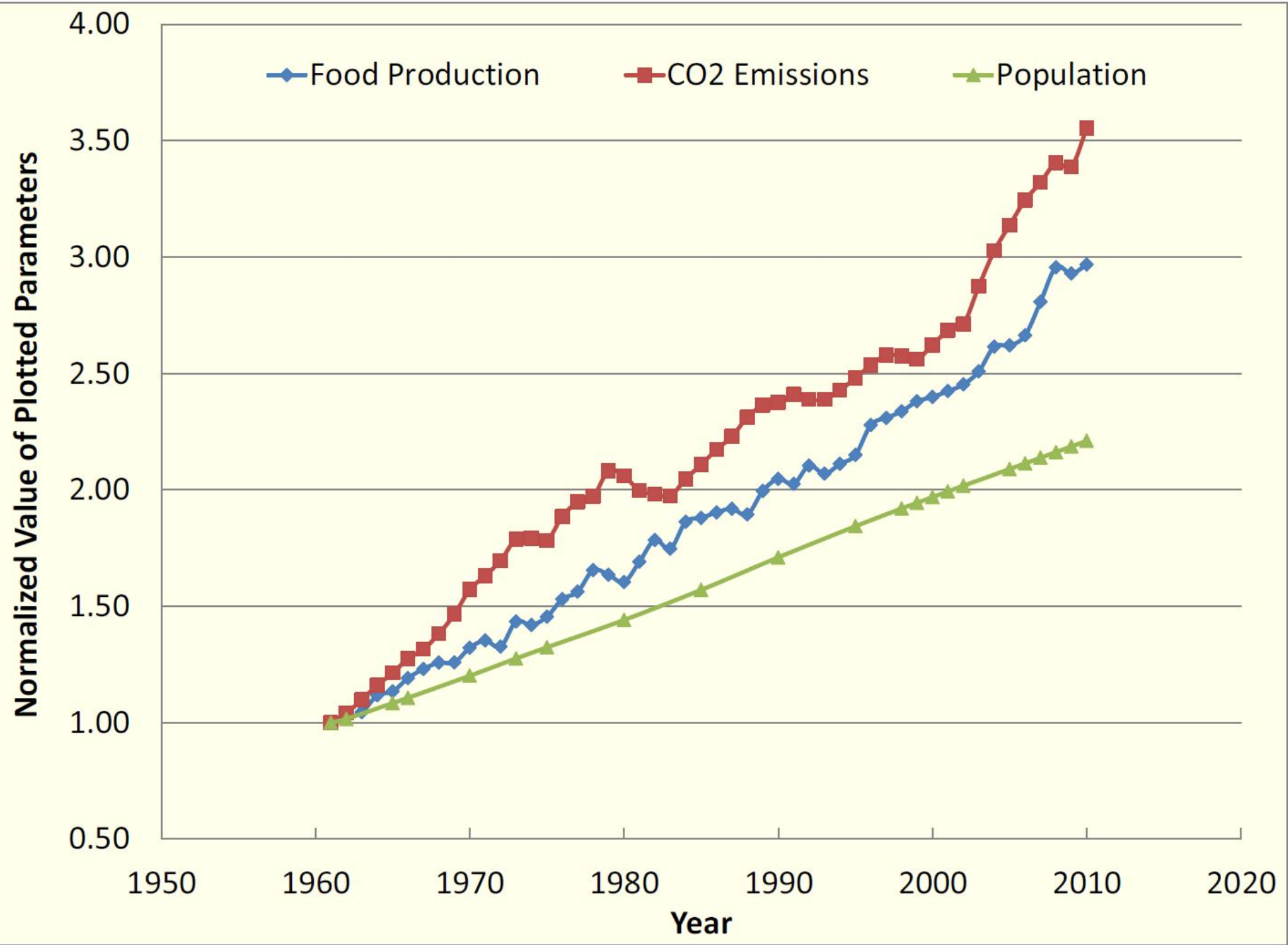
- Despite these clear and well-defined CO₂ benefits, multiple members of the media, activist scientists, nongovernmental organizations and elected and appointed government officials continue to outright deny them
 - They pursue policies at the Federal, state and local level designed to reduce its emission into the atmosphere
 - Such proposed reductions, however, will not come without serious consequences

Reducing global CO₂ emissions by 28 percent (from 2005 levels) would result in a \$1.90 per ton decline in the monetary benefits of CO₂ on global crop production, which is equal to a loss of \$86 billion dollars annually.



“The rising level of atmospheric CO₂ could be the one global natural resource that is progressively increasing food production and total biological output, in a world of otherwise diminishing natural resources of land, water, energy, minerals, and fertilizer. It is a means of inadvertently increasing the productivity of farming systems and other photosynthetically active ecosystems. The effects know no boundaries and both developing and developed countries are, and will be, sharing equally,” for “the rising level of atmospheric CO₂ is a universally free premium, gaining in magnitude with time, on which we all can reckon for the foreseeable future.”

— Dr. Sylvan H. Wittwer



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