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The Global Seed Vault and the Polar Bear: Why We Need Biotechnology

Nina V. Fedoroff

Science and Technology Adviser to the Secretary of State (STAS)

and to the Administrator of USAID

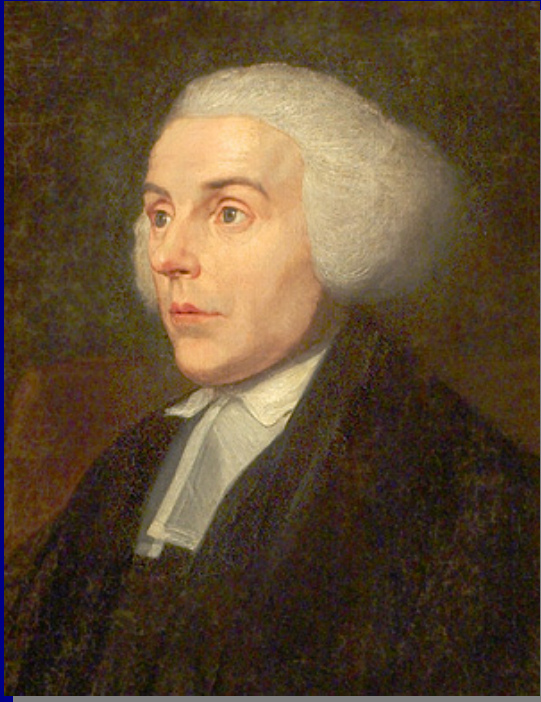
U. S. Department of State

Washington, DC

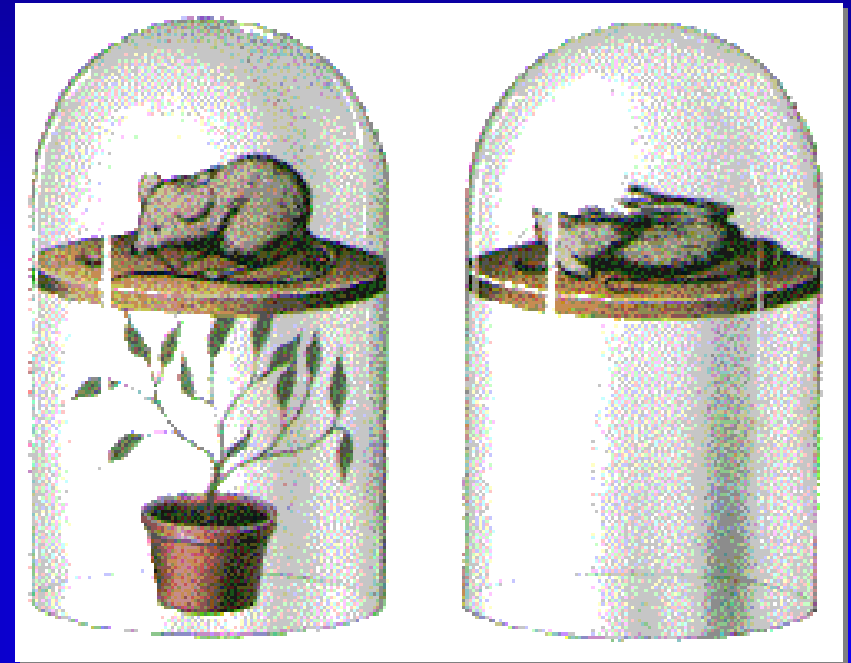


Scientific agriculture began in the 18th century

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Joseph Priestley



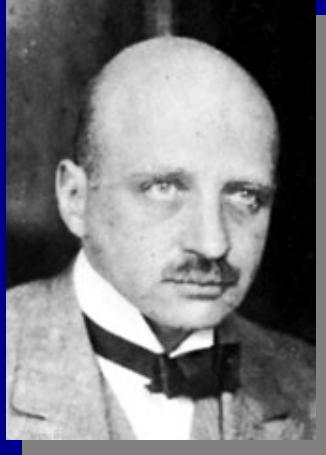
www.chemheritage.org/.../priestley4.jpg

www.juliantrubin.com/.../mouseexperiment.gif

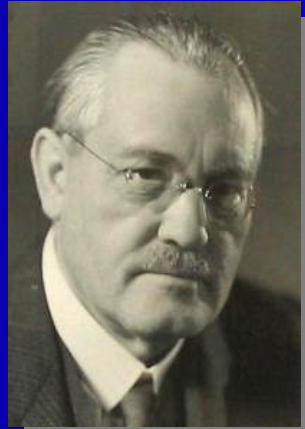


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<http://cache.eb.com/eb/image?id=11308&rendTypeId=4>



Fritz Haber



Carl Bosch

www.eoearth.org/media/approved/e/e6/Bosch.jpg





Genetic modification of maize

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www.kukurydza.org.pl/images/teosinte1.jpg



www.kukurydza.org.pl/images/teosinte1.jpg



<http://www.arini.ac.uk/pics/maize%20altid.jpg>

evolution.berkeley.edu/.../images/cornfld.jpg



Molecular insect resistance: Bt maize

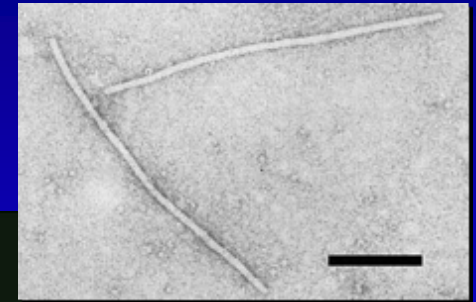
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Molecular disease resistance: Ringspot virus-resistant papaya

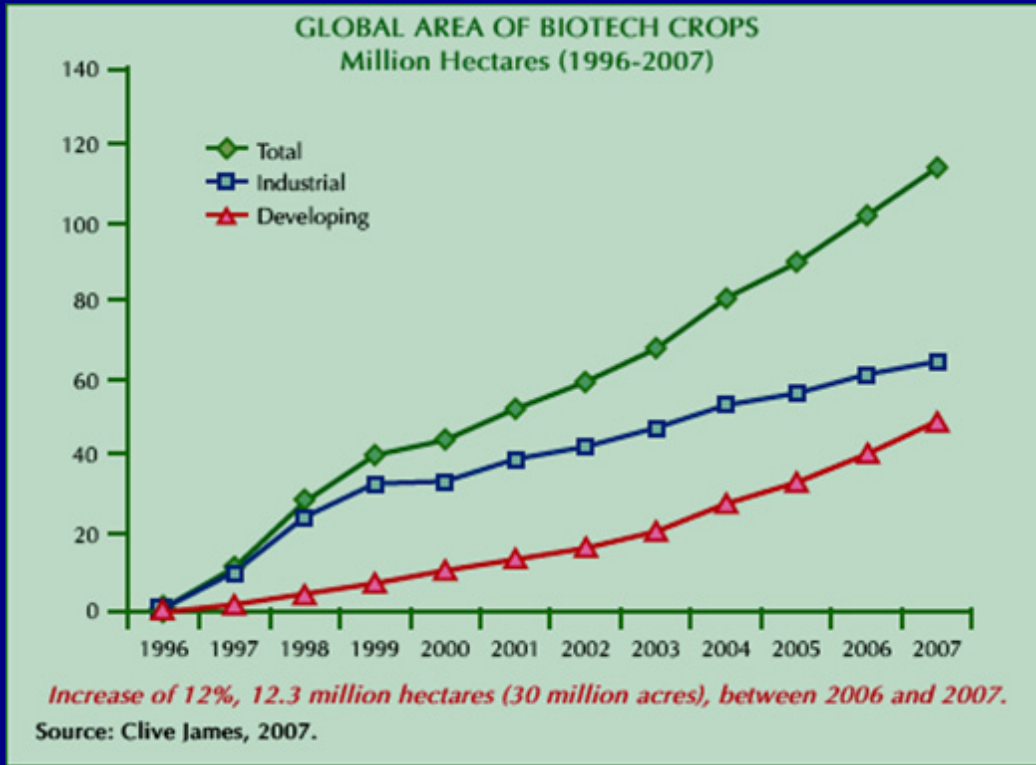
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Rapid acceptance of GM crops

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Millions of hectares planted in GMOs



Fusarium ear rot (fumonisins)



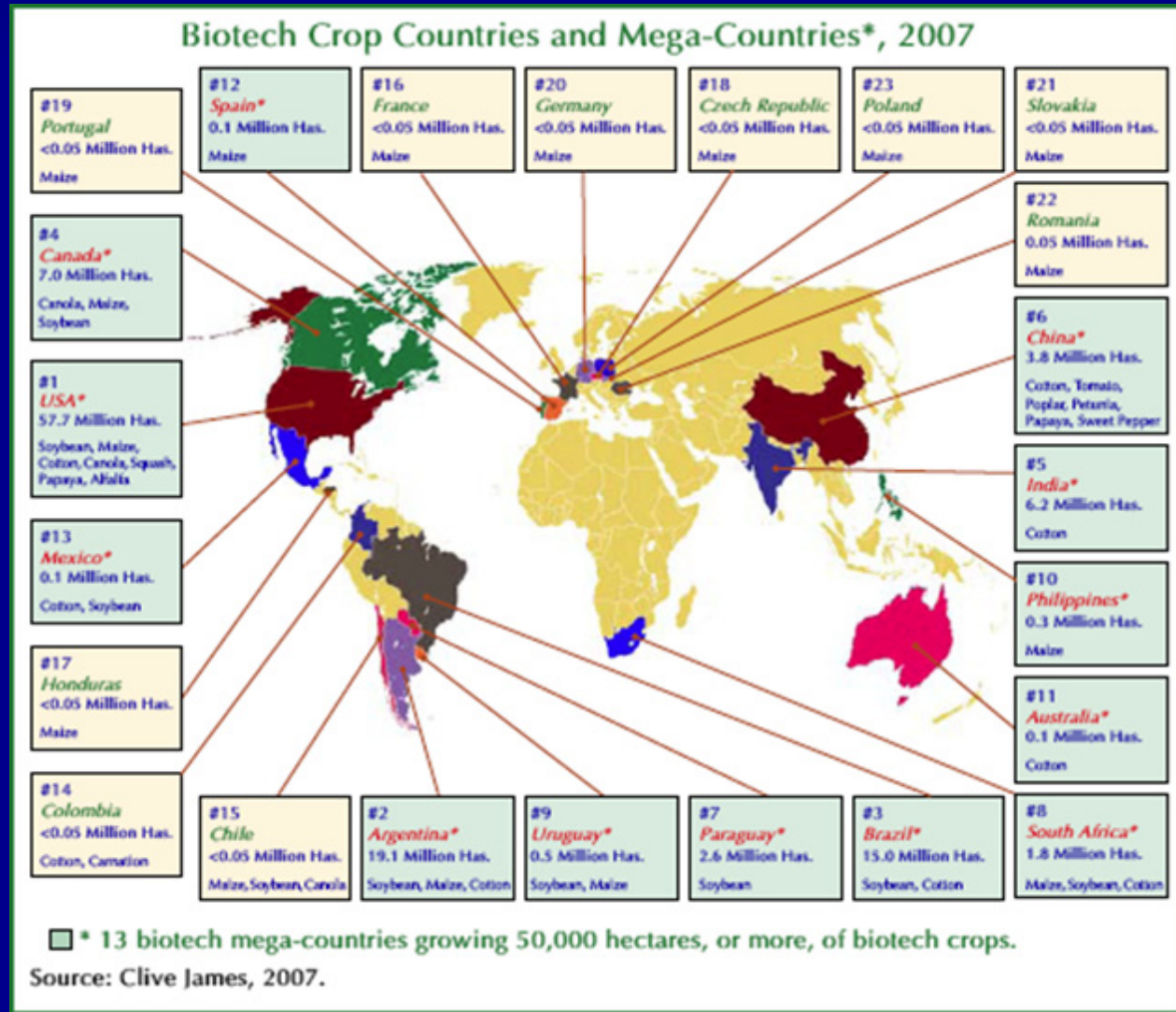
Kernel rot (aflatoxin)



GM crop statistics

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Source: Global status of commercialized biotech/GM crops: 2007, author Clive James



➤ GM crops grown on 114.3 million hectares in 23 countries



Biological pest control is better than chemical pesticides

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<http://evolution.berkeley.edu/evosite/relevance/images/pestspray.jpg>



<http://www.communityipm.org/toxictrail/issue2-Poisoning.html>

➤ 25 million cases of pesticide poisoning/year

➤ Pesticides kill both beneficial and harmful insects



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www.greenpeace.org/raw/image_full/france/



cujtokyo.files.wordpress.com/2007/10/gmo-prot...



http://www.bayweekly.com/year01/issue9_38/images9_38/lead04protestors.jpg



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news.bbc.co.uk/media/images/38455000/gif/_384..

http://news.bbc.co.uk/media/images/38232000/jpg/_38232577_levy150.jpg



Zambia's President
Levy Mwanawasa



Yellow: famine

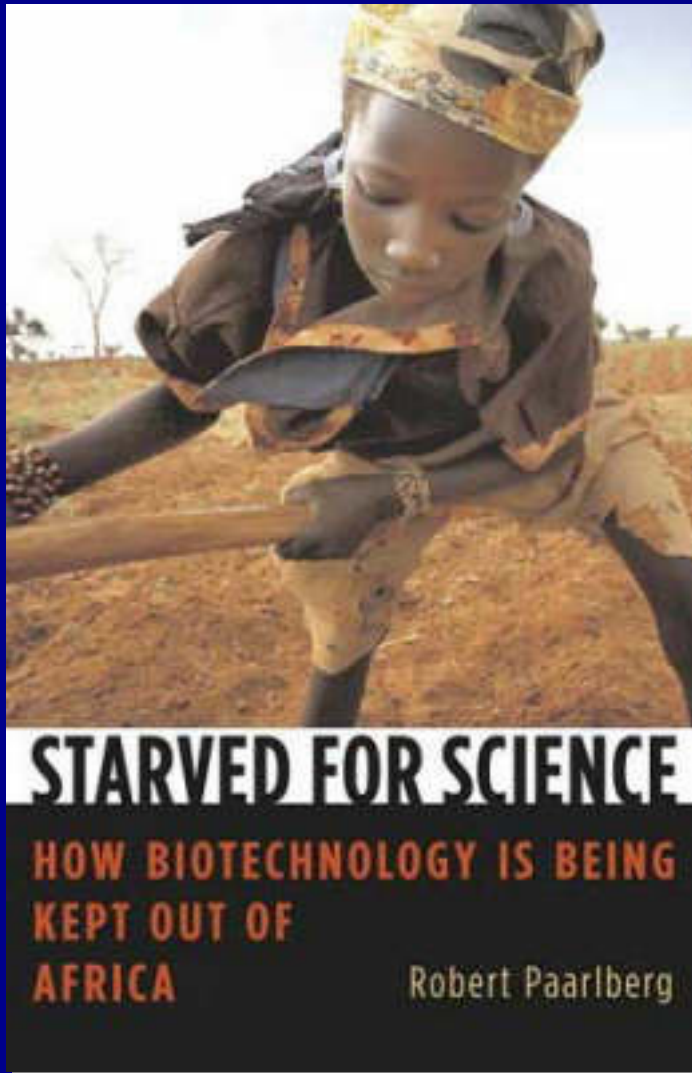


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<https://www.pemelopebokhandel.no/books/covers/9780161714102/9780674029736.jpg>



Rob Paarlberg



Challenges of food security on a finite planet

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- Better seeds and fertilizer
- Credit and insurance
- Storage, food processing, value addition
- Water management
- Roads and market access
- Entrepreneurship
- ICT and information
- Food safety standards and monitoring
- Trade barriers and export controls
- Regulatory barriers
- Research and education



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