

Food and Environmental Safety and the New Crops

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The Mashington Times

December 24, 2003

U.S. Gets First Case of Mad Cow Disease

By JEFFREY SPARSHOTT

The United States reported its first case of mad cow disease yesterday. The disease -- officially known as bovine spongiform encephalopathy, or BSE -- is a chronic, degenerative disorder that attacks the central nervous system of cattle. It has been linked to a fatal brain-wasting disease in humans and has devastated international cattle trade from affected nations.



Factors fueling the controversy in Europe:

- Food safety scares, "They let mad cow disease happen; how can we know the new GM foods are safe?"
- Involuntary nature of the change, "Why weren't we told we were eating these things?",
- Cultural differences, "We like our foods just the way they are!", and
- Economic incentives, "European farm subsidies are the highest in the world".



Are there any foods produced through biotechnology in the supermarket

		ted.	ay?	May	Jan.	Jan. Aug. Apr.		
	<u>1997</u>	1999	1999	2000	2001	2002	2003	
• Yes	40%	33%	38%	43%	36%	35%	36%	
• No	37%	47%	38%	23%	44%	34%	34%	
• Don't Know/Refused	23%	20%	24%	34%	20%	31%	30%	



What, if anything are you concerned about when it comes to food safety?

	Jan.	Sept.	Aug.	Apr.
	2001	2001	2002	2003
• Packaging	27%	18%	17%	15%
• Food Handling/Preparation	23%	38%	42%	41%
• Other	19%	12%	7%	9%
• Disease/Contamination	16%	32%	41%	28%
• Chemicals/Pesticides in Food	10%	5%	8%	7%
• Altered/Engineered Food	2%	2%	2%	1%
• Nothing	9%	3%	4%	5%

How much confidence do you have in federal government to ensure safety of food supply in U.S.?

GREAT DEAL 15%

FAIR AMOUNT 61%

NOT MUCH 19%

NONE 5%

NO OPINION ___

Gallup poll conducted September 23-26, 1999



Nonexhaustive List of Issues with GMO Foods

- Food Safety
- Environmental
- Socioeconomical/Ethical



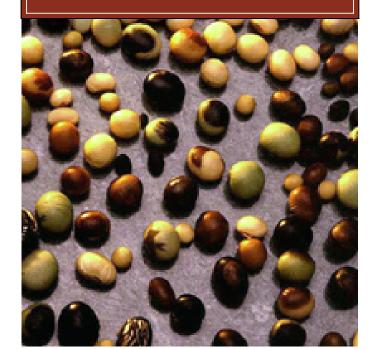
Risk: Determined quantitatively

Safety: Acceptable risk



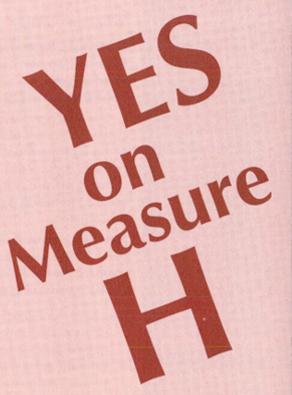


Brazil nut protein introduced into soybean to improve nutritional quality









- Protect our health!
- Protect our farmers!
- Protect our economy!
- Protect our environment!
- Protect our private property!

Keep Mendocino County GMO FREE!



one planted a fiel ucbiotech.org M ne pollen that would crop onto a neighbo ps, that the neighbor

and grapevines and other non-GMO food

crops and destroy their markets bility, and

subject those who consume these crops to

ancontrolled health risks and seriously

disrept the local ecosystem. The

does not require the labor

organic certification.
little research to find
I talked to Ray Greene use man Organics for the State of Californi



Creation of hypoallergenic rice





Regulatory Systems in the U.S. (existing regulations)

USDA

FDA

EPA

- Field testing
 - permits
 - notifications
- Determination of non-regulated status

- Food safety
- Feed safety

- Pesticidal plants
 - tolerance exemption
 - registrations
- Herbicide registration



Data Requirements for Approval of Genetically Enhanced Products

- Toxicology and Allergenicity
- Detailed review of the safety data
- Testing for allergenicity
- No transfer of food allergens
- In vitro digestibility
- Heat stability
- Oral toxicity testing in mice (100 x normal consumption)





Kraft Food recalls all taco shells sold nationwide under Taco Bell Brand

SOURCE: Washington Post, September 19, 2000







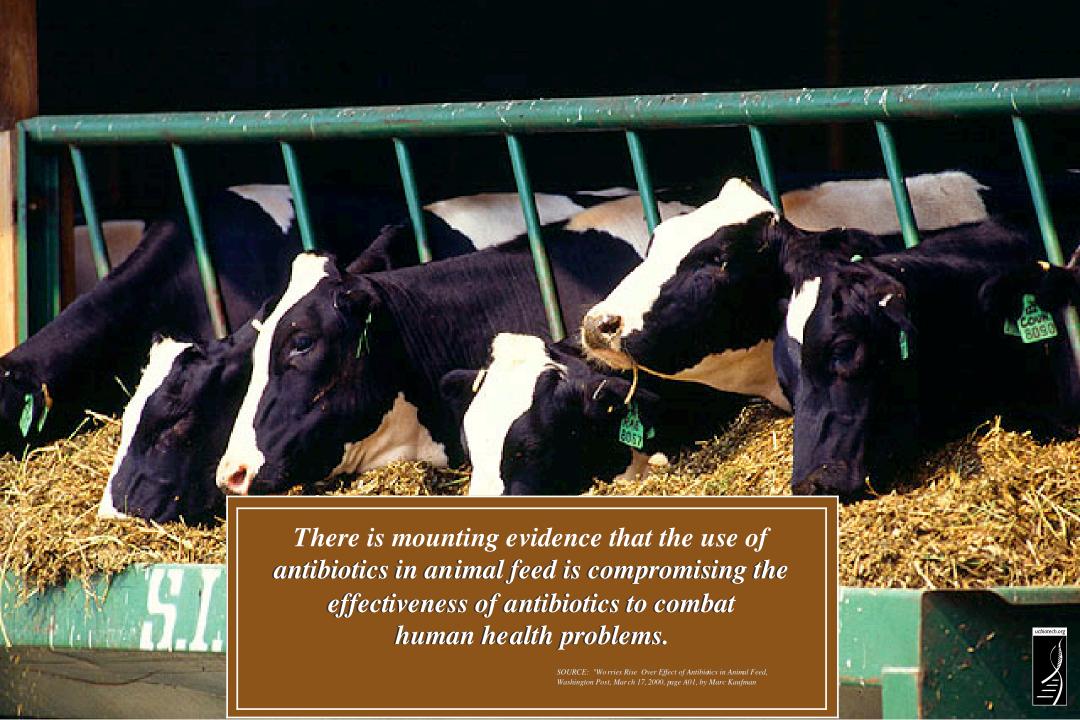






Horizontal Gene Transfer and Spread of Antibiotic Resistance





Environmental Issues

- Unintended Effects on Insect Pests
- Development of Weeds Resistant to Herbicides
- Movement of Genes to Other Plants
- Loss of Genetic Diversity
- Increased Herbicide Usage

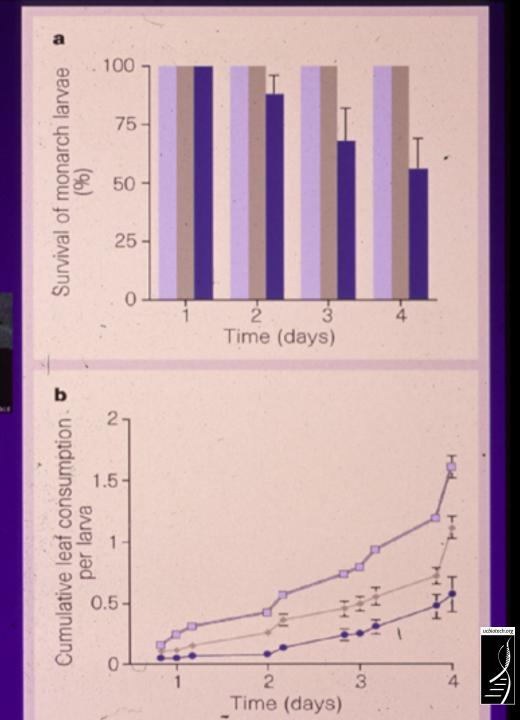


Effect on Bystanders?

Monarch butterfly study

Losey et al. 1999

- Criticisms:
 - pollen dosage?
 - lab study



Environmental Safety

- Speed of soil degradation
- Impact on soil invertebrates
- Earthworms
- Impact on aquatic invertebrates
- Daphnia
- Impact on beneficial insects
- Ladybugs, parasitic wasps, honeybees and lacewings
- Impact on fish
- Trout
- Impact on birds
- Quail
- Impact on mammals
- Mice
- Insect resistance management



The New Hork Times

September 8, 2001

Data on Genetically Modified Corn Reports Say Threat to Monarch Butterflies Is 'Negligible'

By ANDREW POLLACK

Genetically modified corn poses a "negligible" risk to monarch butterflies, according to a package of six papers that will soon be published in a scientific journal. The papers, the most comprehensive peer-reviewed publications on this issue, could lay to rest one of the biggest controversies over genetically modified crops.





Parasitoid wasp of canola pest not affected by B.t. canola, making it ecologically superior to conventional insecticides that kill the wasp.

SOURCE:Poppy et al., 1999. Parasitoid behaviourand Bt plants. Nature 400: 825.



Development of herbicide resistant weedy species



RYEGRASS

Lolium rigidum

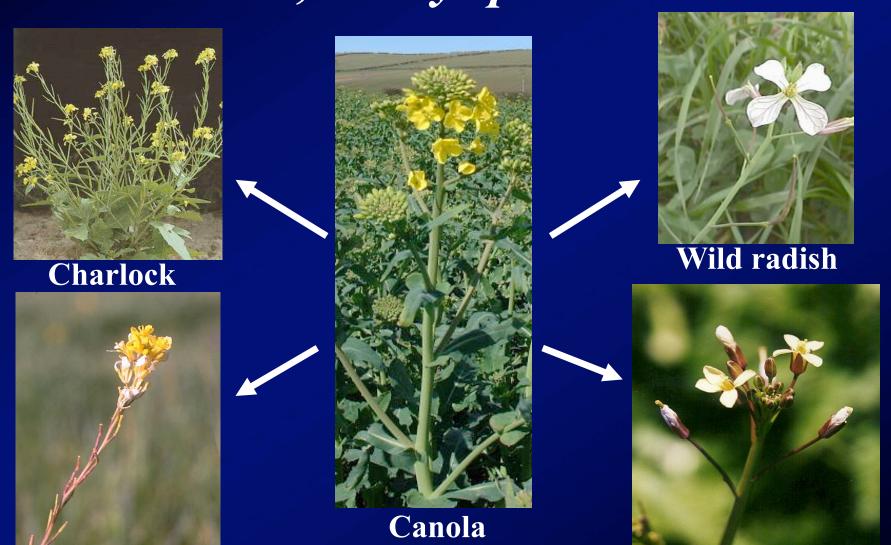
GOOSEGRASS

Eleusine indica (L.)

HORSEWEEDConyza canadensis (L.)



Movement of genes from cultivated crops to wild, weedy species



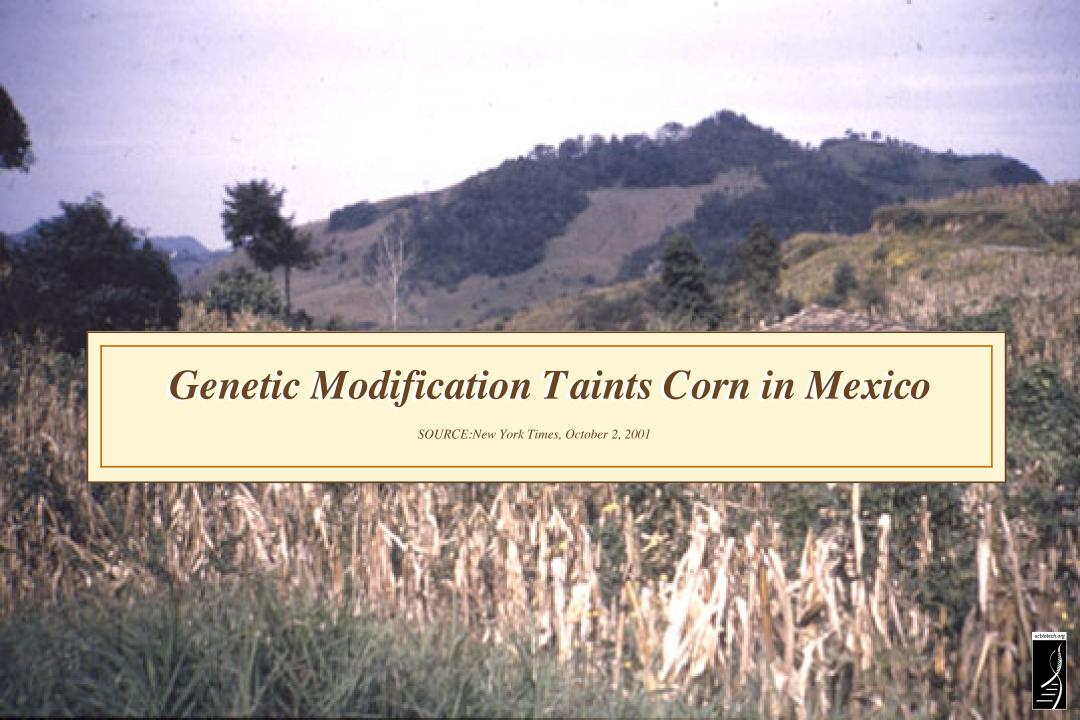
Brassica tournefortii

Buchan weed

Gene flow from rice to weedy, red rice











Altered Crops Draw Protests, Pro and Con



