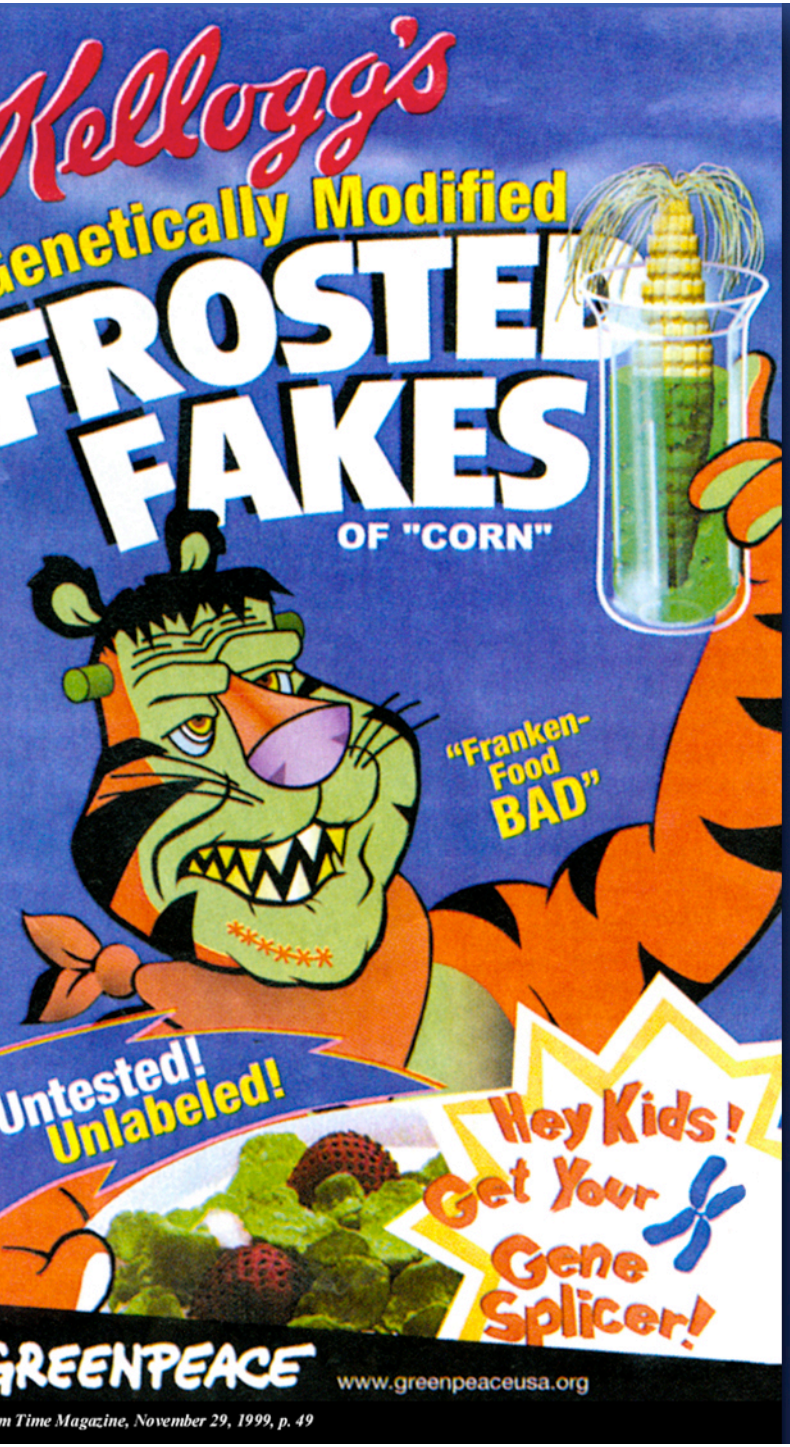


Foods Fights in the Marketplace A Look at Some Issu

Edit View Favorites Tools Help

Search Favorites Media

http://altercampagne.free.fr/

JIGMOD

Día internacional de oposición colectiva a los OGM
Journée Internationale d'Opposition Collective aux OGM
Joint International GMOpposition Day

AlterCampagn

líricas / lyrics / paro

- avril 2006
- 8 juin 2005
- mai 2004
- stes
- ocuments
- ontact

in English

8 April 2006

en español

A worldwide event (see the **International Program**) *is to be held on the* 8th of April 2006, *with the two informing people and demonstrating the front of concerned* organizations *against GMOs (both open-air food). This action will be distributed over several* Information Sites, *possibly linked through* Internet video *The medias will be issued with the international program by the end of March; until then, the projec according to a given* Agenda.

Dia / Jour / Day:

D - 4

Visitantes / Visiteurs / Visitors:
03436

Actualizado / Mis à jour / Updated:
A(pbv)ril 2006

News of the Weeks W - 1

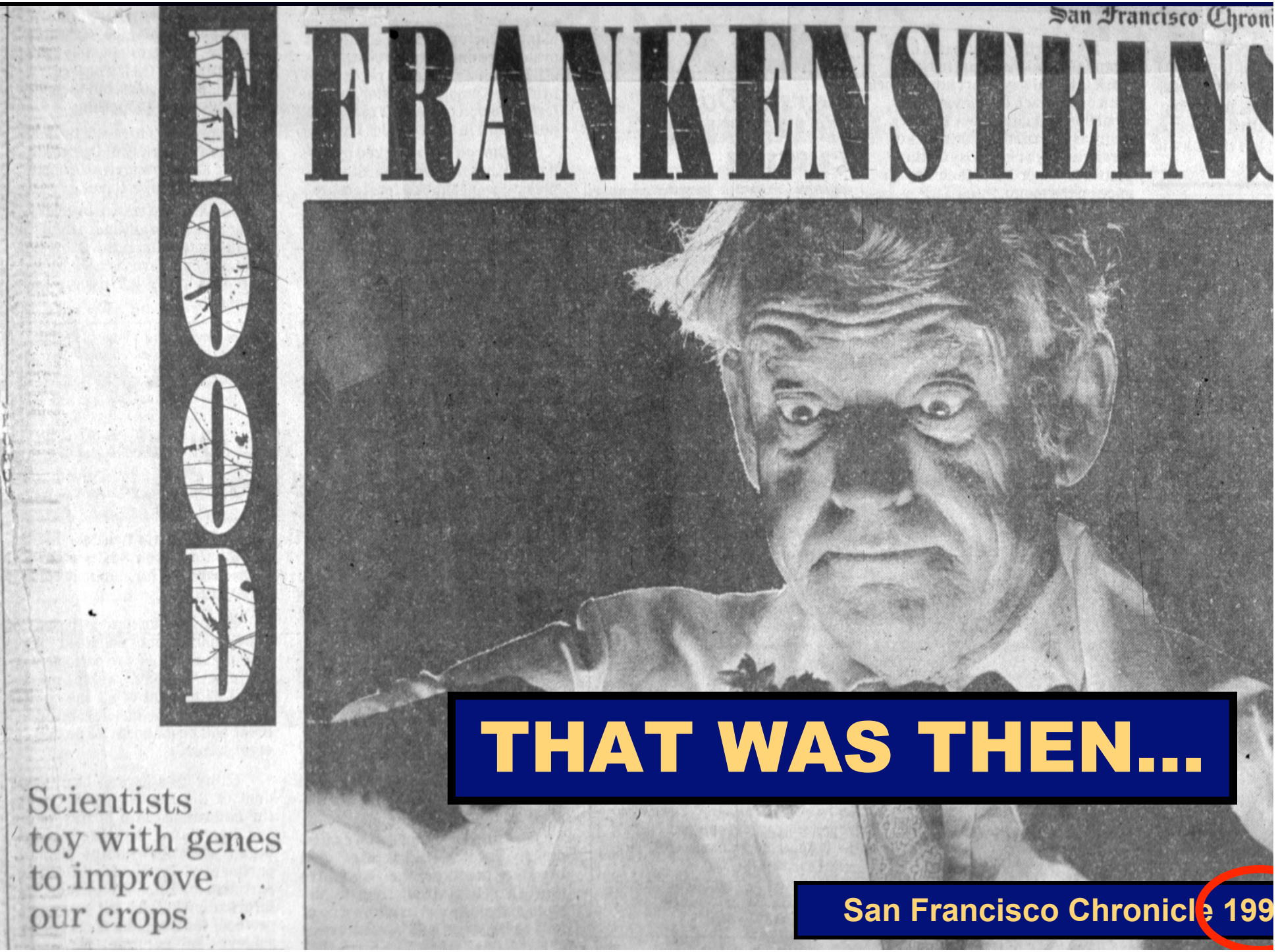
previous weeks

- On the 8th of April, there will be **at least 120 "hot spots" on every continents** (except the Antartic, maybe).

- Day "D"- 8, a quantitative view of the international mobilization against "free GMOs" :
  387 'information stalls
  213 stands of GMO-free farm products
  138 conferences, debates, forum
  123 picnics or food stalls
  72 displays of movies
  65 petitions
  54 music bands
  47 "Peasant Seeds" related actions
  47 street theater performances
  38 participants to the visioconference
  19 radio or TV programs, Press Conferences

- In conjunction with JIGMOD, a three disc s launched: "**The GMO Trilogy: Why Genetically Modified Organisms threaten your health, the environmer and future generations**" (by Jeffrey of Plainfield).




San Francisco Chroni
FRANKENSTEINS
FOOD
Scientists
toy with genes
to improve
our crops
THAT WAS THEN...
San Francisco Chronicle 199

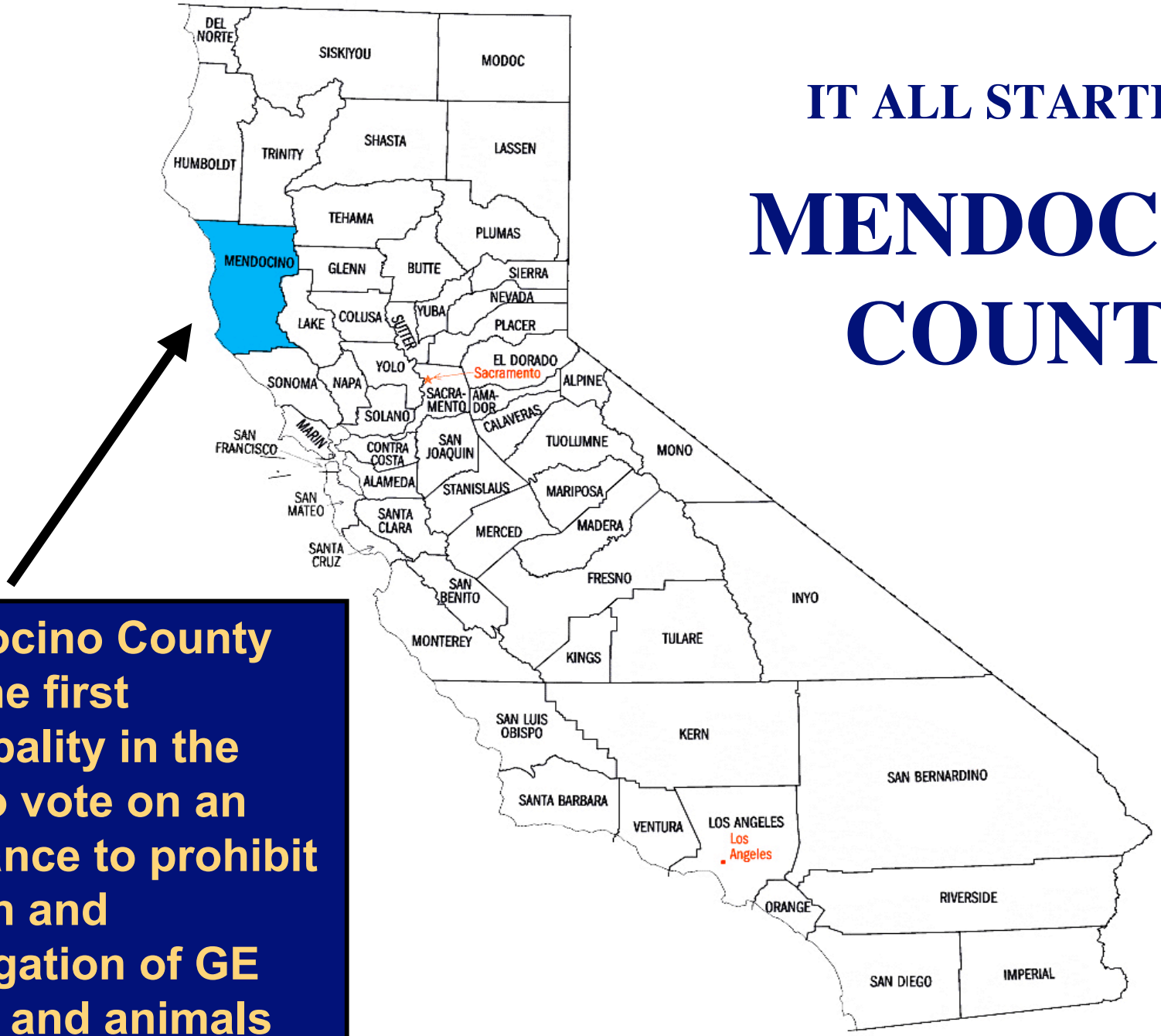


...THIS IS NOW

As of 3/2/06

IT ALL STARTED IN

MENDOCINO COUNTY



Mendocino County was the first principality in the U.S. to vote on an ordinance to prohibit growth and propagation of GE plants and animals

March 2004 MENDOCINO

MEASURE H – passed March 2004

56% For; 44% Against

- "unlawful for any person, firm, or corporation to propagate, cultiv raise, or grow genetically modified organisms in Mendocino Cour (excludes microorganisms)
- "DNA or deoxyribonucleic acid means a complex protein that is present in every cell of an organism…"
- The ban does not pertain to properties within city limits, or lands managed by State, Tribal and Federal agencies.
- At election time, no GE organisms were known to be in productio Mendocino County.

The discourse on both sides of the issue is often driv by alarming assertions and facts that were not deriv from, nor supported by science

"Measure H should be rescinded…on the basis that multitudinous GMOs always been in Mendocino County and would be impossible to eliminate bec

1. Animals such as deer, bear, racoons, etc. are impossible to exclude
2. Fire retardants for fighting forest fires cannot be abolished…
3. …in order to remove present GMOs all soil would have to be plowe under or removed…
4. Birds and beees are impossible to prevent from invasion.
5. Any leather goods or imported footwear, clothing..would have to be inspected at checkpoints on every road coming into the county…
6. Anyone visiting another county or coming in on a plane, train, or bo would have to have a security check.

All of the above I have thoroughly investigated through pertinent organizations…"

Marie White, Ukiah Daily Journal 11/16/03

The discourse on both sides of the issue is often dri
by alarming assertions and facts not derived from
nor supported by science

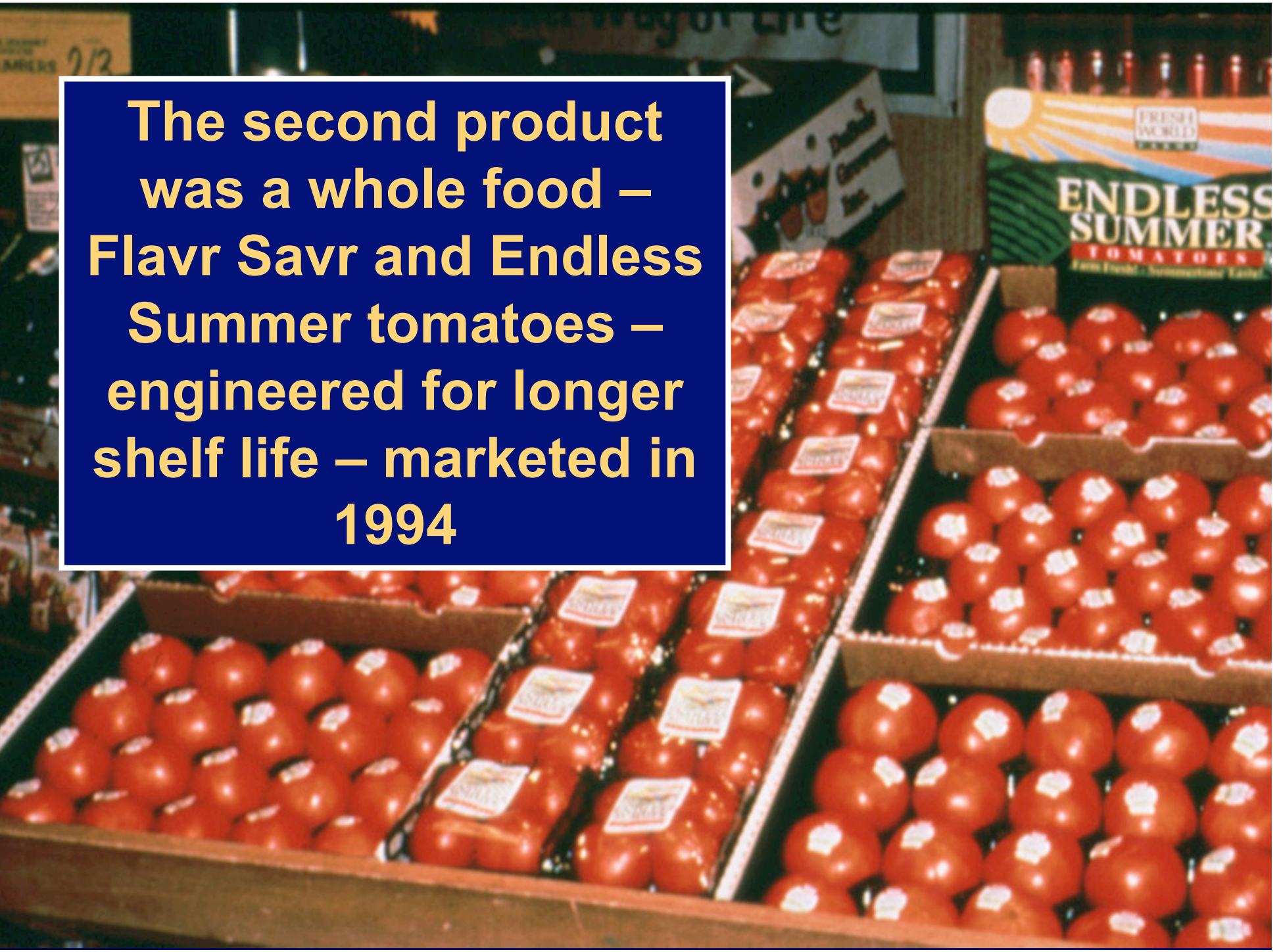
"When my son was 6 month (sic) old and receiving chemotherapy for leukemia, he was also receiving soy lipids intraveneously because he had lost the ability to e or drink. The longer he received the lipids, the higher th dose of chemo. When I asked why, I was told that the soybeans used were genetically modified to be "Round Ready," they were putting food into my son's veins that could withstand the chemicals they were using to kill th leukemia blood cells, making the chemo less effective. I order to keep my son alive nutritionally, the higher dose of chemo almost took him away "

Jenny Shattuck-Hale, Ukiah Daily Journal, 2/20/04

?

When Did the Genetic Engineering of Foods Start and Where?


GE rennin – used to make cheese - was the first GE product in foods - 1990
COLBY
DOMESTIC FETA
DELI WRAP CHEESE
539 051
TOTAL PRICE
2.75
Deli
Imported from DENMARK
DOFINO
CREAMY HAVARTI
Holland Farm
GOUDA
MUENSTER



The second product was a whole food – Flavr Savr and Endless Summer tomatoes – engineered for longer shelf life – marketed in 1994

These tomatoes were labeled as GM and sold in markets in Europe until…





happened in Europe in late 1990



Greenpeace decontaminates GM field - Lord Melchett arrested

SOURCE: 7/26/99, Lyng/Norfolk, Greenpeace

Factors that fueled controversy in Europe

- Food safety scares, “They let mad cow disease happen; h
  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 the
  are!”, and
- Economic incentives, “European farm subsidies are
  the highest in the world”.

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

	1999	2004
GREAT DEAL	15%	31%
FAIR AMOUNT	61%	54%
NOT MUCH	19%	14%
NONE	5%	
NO OPINION	--	

Gallup poll conducted September 23-26, 1999

How much would you say you kno about government regulation of genetically modified food?

	Aug. 2003	Sept. 2004
Great Deal	2%	1%
Some	11%	11%
Not too much	31%	28%
Nothing at all	53%	55%
Don't Know	4%	5%

Pew Initiative on Food and Biotechnolo


What is the U.S. regulatory process

The New York Times

January 25, 2001

Biotechnology Food: From the Lab to a Debacle

By Kurt Eichenwald

How was the regulatory structure decided upon?

“In late 1986 four executives of the Monsanto Company, the leader in agricultural biotehnology, paid a visit to Vice President George Bush at the White House to make an unusual pitch.

‘There were no products at the time,’ Leonard Guarraia, a former Monsanto executive who attended the Bush meeting, recalled in a recent interview. ‘But we bugged him for regulation. We told him that we have to be regulated.’

In the weeks and months that followed, the White House complied, working behind the scenes to help Monsanto – long a political power with deep connections in Washington – get the regulations that it wanted.”

Coordinated Framework for Biotechnology

- Completed in 1986
- Covers full range of plants, animals & microorgani
- Based on concept of product, not process
- Based on intended use and existing statutes

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

USDA

- Field testing
  -Permits
  -Notifications
- Determination of non-regulated status

FDA

- Food safety
- Feed safety

EPA

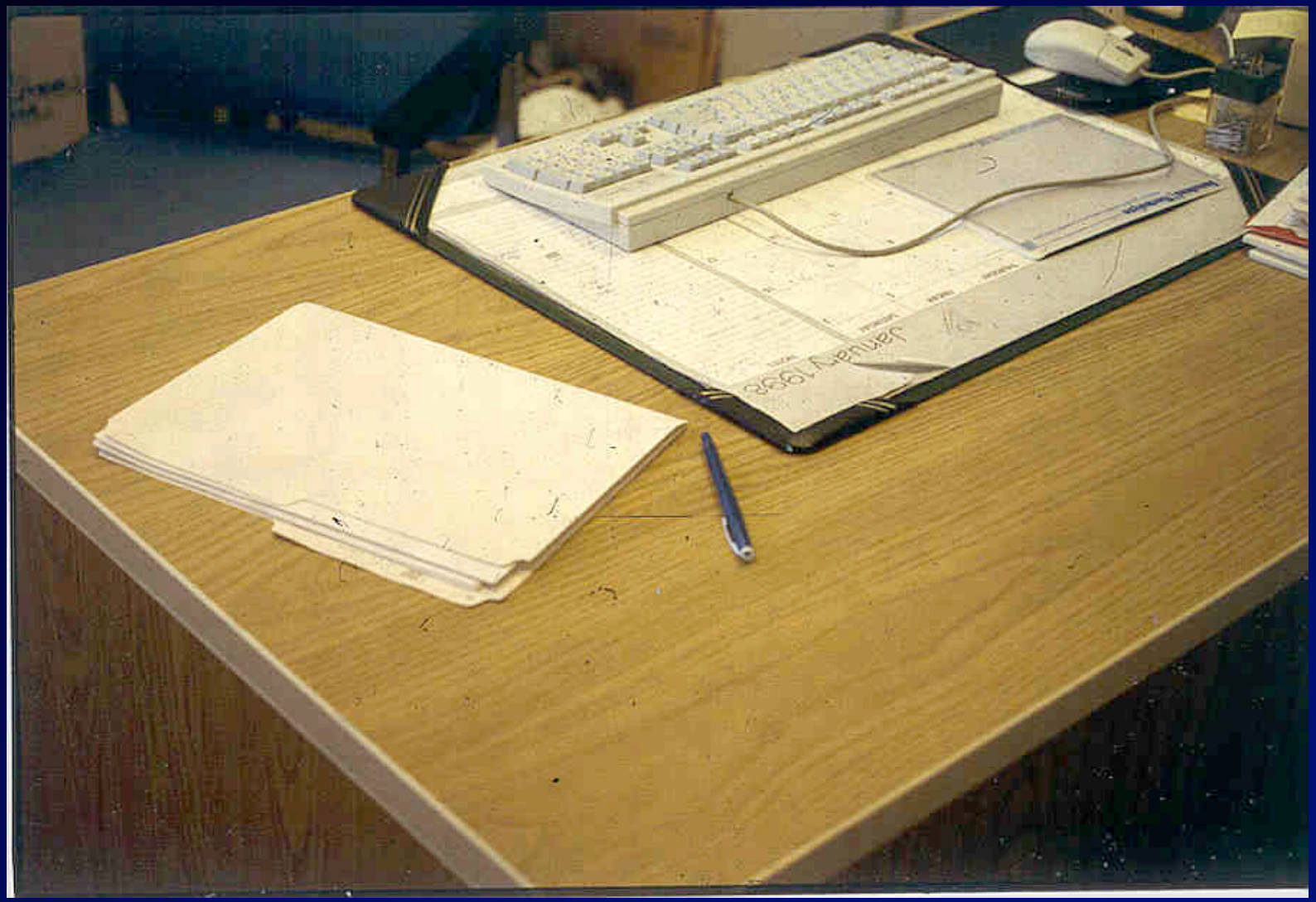
- Pesticidal plants
  -tolerance exe
  -registrations
- Herbicide regist

Nine Steps of Safety Evaluation of GM Crops by US Federal Regulatory Agencie

1. NIH Biosafety Guidelines
2. USDA greenhouse standards and inspections
3. USDA field trial authorization
4. USDA authorization of transport for field trials
5. USDA detemination of nonregulated status
6. EPA experimental use permit
7. EPA determination of food tolerance or tolerance exceptio
8. EPA product registration
9. FDA review process (voluntary pre-market consultation)

Variety release requirements: Conventional cultivars

- Agronomic performance
- Proximate analysis
- Antinutritive factors



Variety release requirements: Transgenic cultivars

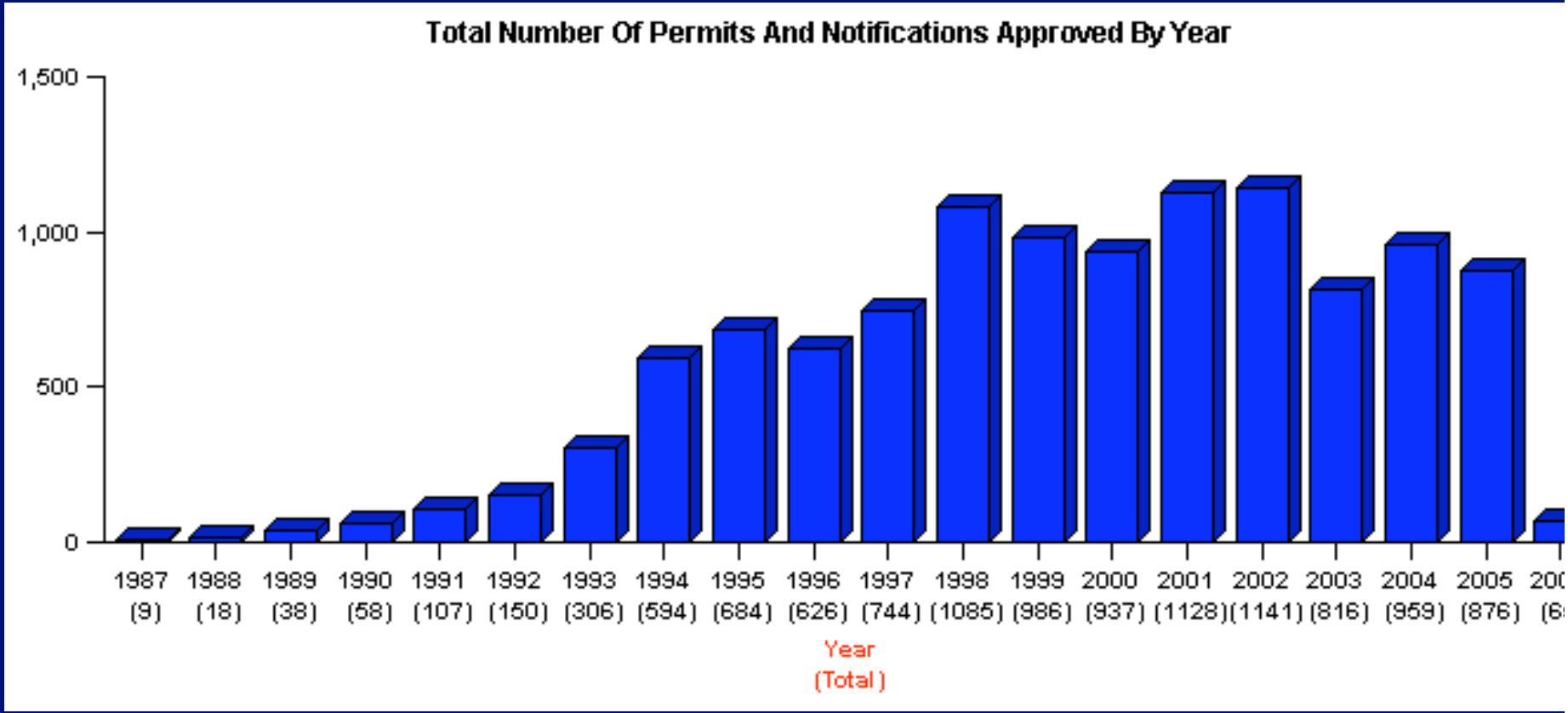
- Agronomic performance
- Proximate analysis
- Antinutritive factors
- *Plus:*

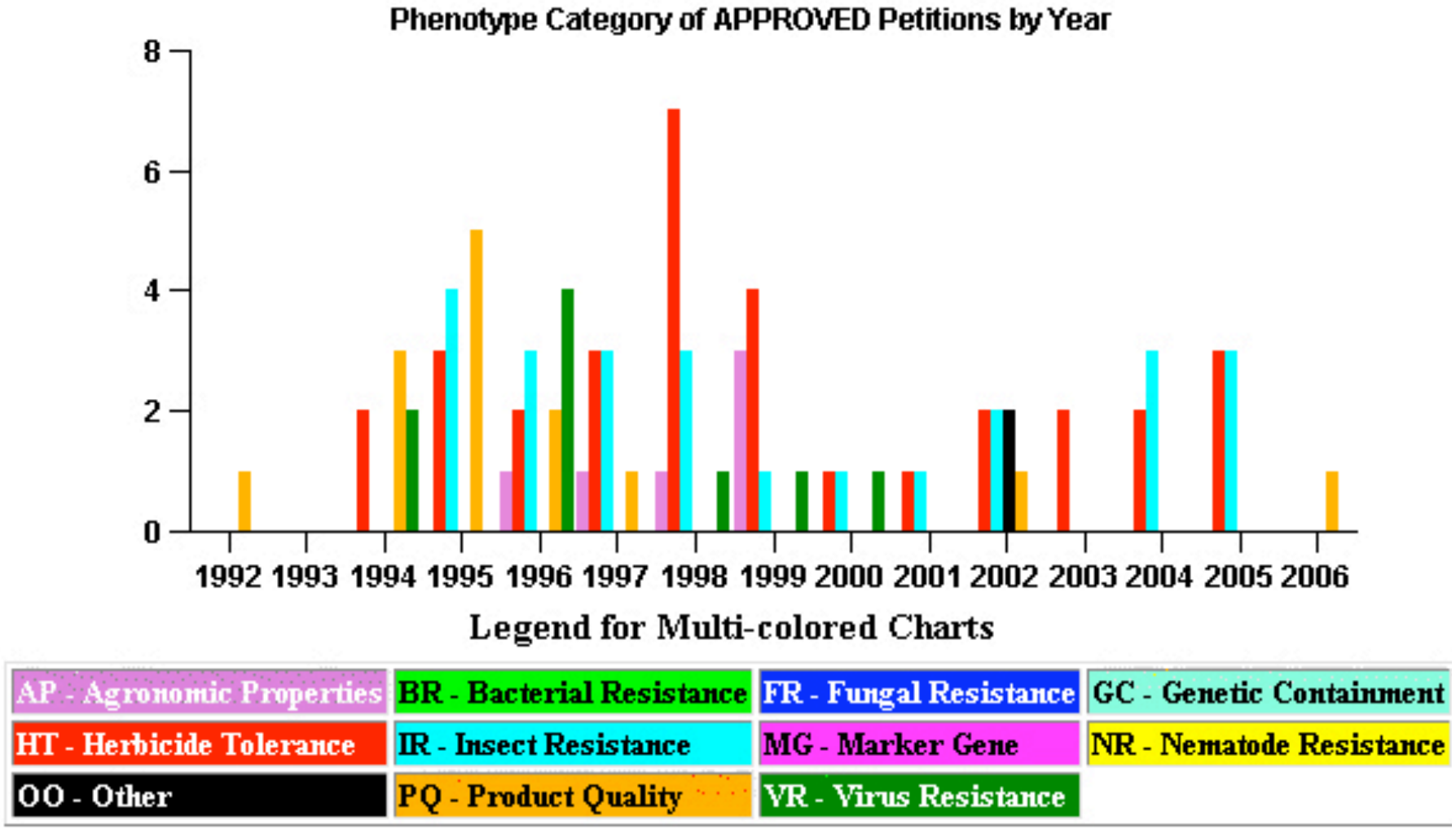
Plus:

- Molecular characterization of inserted DNA,
- Southern and restriction analyses
- PCR for several fragments,
- Various enzyme assays (ALS, NOS, NPT-II)
- Copy number of inserts
- Size of each fragment,
- Source of each fragment
- Utility of each fragment
- How fragments were recombined
- How construct was delivered into flax
- Biological activity of inserted DNA (genes)
- Quantitative analyses of novel proteins (western analyses)
- Temporal activity of inserted genes
- spatial activity of inserted genes
- complete amino acid analysis
- detailed amino acid analysis for valine, leucine and isoleucine
- Toxicity (feeding trials were not warranted)
- Allergenicity (feeding trials were not warranted)
- Biological analysis:
- Pathogenicity to other organisms
- dormancy,
- outcrossing
- potential for horizontal gene transfer
- seed production
- flowering time,
- flower morphology
- analysis of relatives
- stability of inserted genes over seed generations
- survivability in natural environment
- survivability in agricultural environment in presence of herbicide
- survivability in agricultural environment in absence of herbicide
- Interaction with other organisms- alterations to traditional relationships
- Interactions with other organisms- novel species
- Changes to persistence or invasiveness
- Any selective advantage to the GMO
- Any selective advantage to sexually compatible species
- Plan for containment and eradication in the event of escape



Field Tests Authorized 1987-2006





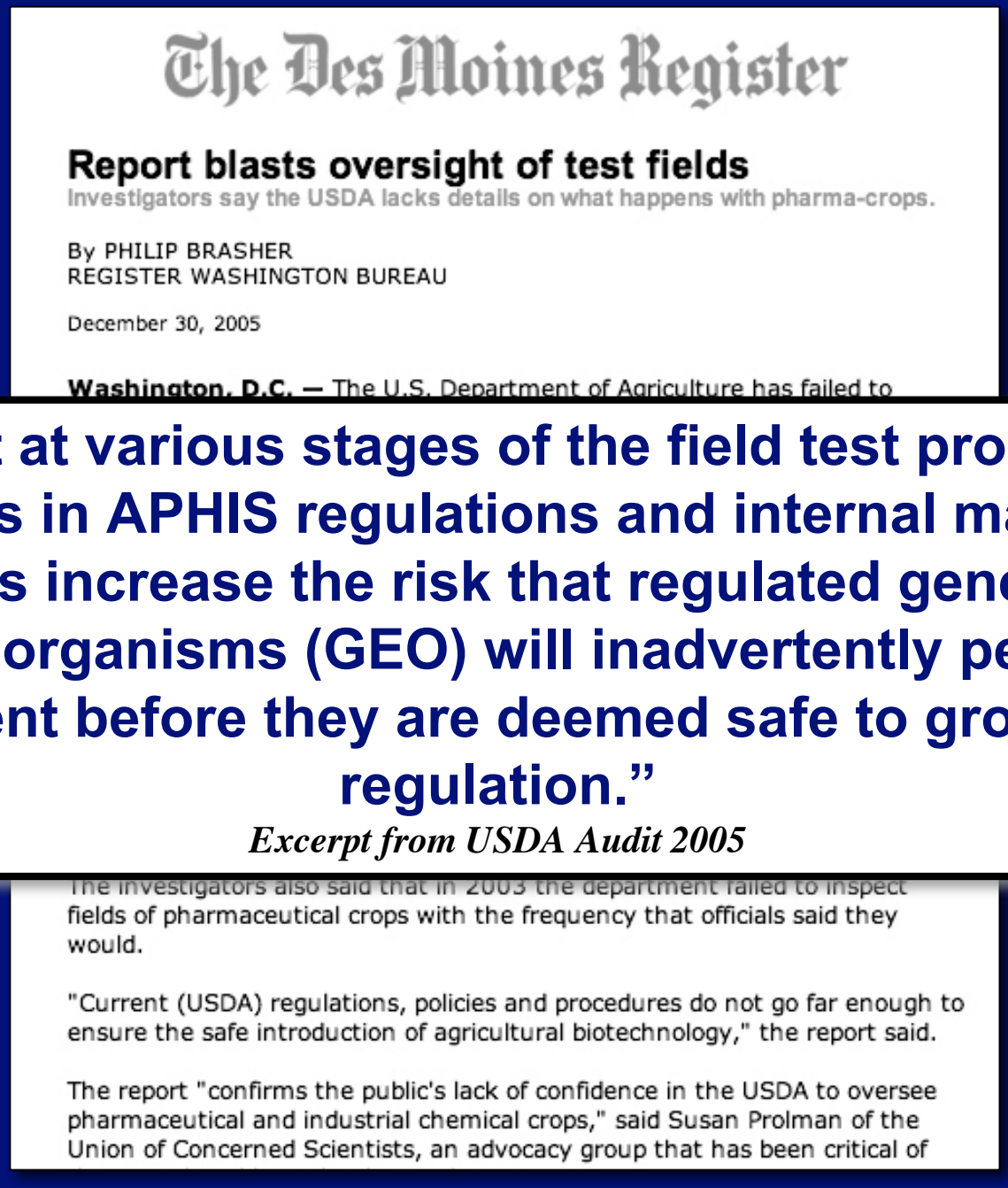
SOURCE: http://www.isb.vt.edu/cfdocs/biocharts1.cfm

APHIS Determination of Nonregulated Status

- Alfalfa - HT
- ✓ Corn - HT, IR, AP
- ✓ Soybean - HT, PQ
- ✓ Cotton - HT, IR
- ❖ Potato - IR, VR
- ❖ Tomato - PQ
- • Squash - VR
- ✓ Canola - HT
- • Papaya - VR
- ❖ Rice - HT
- • Rapeseed - HT, AP, PQ
- ❖ Sugar beet - HT
- ❖ Flax - HT
- • Chicorium - AP
- • Tobacco - PQ

✓Large-scale production
❖Not on market

Once determination of nonreglated status is made, organism no longer requires APHIS review for moveme or release in U.S.



The Des Moines Register

Report blasts oversight of test fields

Investigators say the USDA lacks details on what happens with pharma-crops.

By PHILIP BRASHER
REGISTER WASHINGTON BUREAU

December 30, 2005

Washington, D.C. — The U.S. Department of Agriculture has failed to

"In fact at various stages of the field test process… weaknesses in APHIS regulations and internal managemen controls increase the risk that regulated genetically engineered organisms (GEO) will inadvertently persist in th environment before they are deemed safe to grow without regulation."

Excerpt from USDA Audit 2005

The investigators also said that in 2003 the department failed to inspect fields of pharmaceutical crops with the frequency that officials said they would.

"Current (USDA) regulations, policies and procedures do not go far enough to ensure the safe introduction of agricultural biotechnology," the report said.

The report "confirms the public's lack of confidence in the USDA to oversee pharmaceutical and industrial chemical crops," said Susan Prolman of the Union of Concerned Scientists, an advocacy group that has been critical of

SOURCE: http://www.desmoinesregister.com/apps/pbcs.dll/article?AID=/20051230/BUSINESS01/512300334&SearchID=73231131107

United States Food and Drug Administratio



United States Environmental Protection Agen



Environmental Protection Agency

- EPA has jurisdiction over new chemical substances introduced into U.S. market.
- Government defines all genetically-modified microbes - including bacteria, fungi, viruses and protozoa - as new chemical substances, under EPA's authority.

Proposed EPA Plant Pesticide Rule

EPA proposed to regulate and designate plants engineered with genes for pest resistance as pesticides and would be labeled as pesticides

Scientific and professional societies found the policy scientifically indefensible and publicly fought the proposed rule because:

- Pest-resistant GE plants might be indistinguishable from conventionally bred plants, but regulated differently
- Regulation should focus on degree of risk, not the means by which plants were created
- EPA ultimately decided that such plants would be termed PIPs



Plant-incorporated protectant

Federal Decision Tree for GM Food Safety

Evaluate safety of source organism – gene/ protein

Relatedness of protein to toxicant or allergen, *e.g.*, peanuts



Safety of genes and expression products of gene

Specificity or mode of action of protein; stability of protein to digestion and processing



Establish safety of consumed food

How frequently do consumers eat the food? Artichokes vs. corn



Example of studies submitted to EPA/FDA for Bt corn

- Molecular characterization of insect protected corn line MON 810.
- Evaluation of insect-protected corn lines in 1994 U.S. field test locations.
- Assessment of the equivalence of B.t.k. HD-1 protein produced in several insect protected corn lines and *Escherichia coli*.
- Compositional comparison of *Bacillus thuringiensis* subsp. *kurstaki* HD-1 protein produced in ECB resistant corn and the commercial microbia DIPEL.
- Assessment of the equivalence of *Bacillus thuringiensis* subsp. *kurstaki* HD 1 protein produced in *Escherichia coli* and European corn borer res
- A dietary toxicity study with MON 80187 meal in the northern bobwhite.
- Aerobic soil degradation of *Bacillus thuringiensis* var. *kurstaki* HD-1 protein.
- Acute oral toxicity study of Btk HD-1 tryptic core protein in albino mice.
- Assessment of the in vitro digestive fate of *Bacillus thuringiensis* subsp. *kurstaki* HD-1 protein.
- Stability of the Cry1A(b) insecticidal protein of B.t.k. HD-1 in sucrose and honey solutions under non-refrigerated temperature conditions.
- Evaluation of the dietary effects of purified B.t.k. endotoxin proteins on honey bee adults.
- Activated B.t.k. protein: a dietary toxicity study witih green lacewing larvae.
- Activated B.t.k. protein: a dietary toxicity study with parasitic hymenoptera (*Brachymeria intermedia*).
- Activated B.t.k. protein: a dietary toxicity study with ladybird beetles.
- Evaluation of European corn borer resistant corn line MON 801 as a feed ingredients for catfish.
- Cry1A(b) insecticidal protein: an acute toxicity with the earthworm in an artificial soil substrate.
- Effects of the *Bacillus thuringiensis* insecticidal proteins Cry1A(b), Cry1A(c), Cry3A on *Folsomia candida* and *Xenylla grisea* (Insecta: Collen
- Supplemental submission to MRID 43665502 on the expression of the Cry1A(b) protein in insect-protected line MON 810.
- Supplemental submission on the tissue expression and corn earworm (*Helicoverpa zea*) efficacy of the Cry1A(b) protein in insect-protected cor
- Chronic exposure of *Folsomia candida* to corn tissue expressing Cry1A(b) protein.
- Corn pollen containing the Cry1A(b) protein: a 48-hour static-renewal test with Cladoceran (*Daphnia manga*).

Safety of remaining edible portion of food: safe as conventional food?

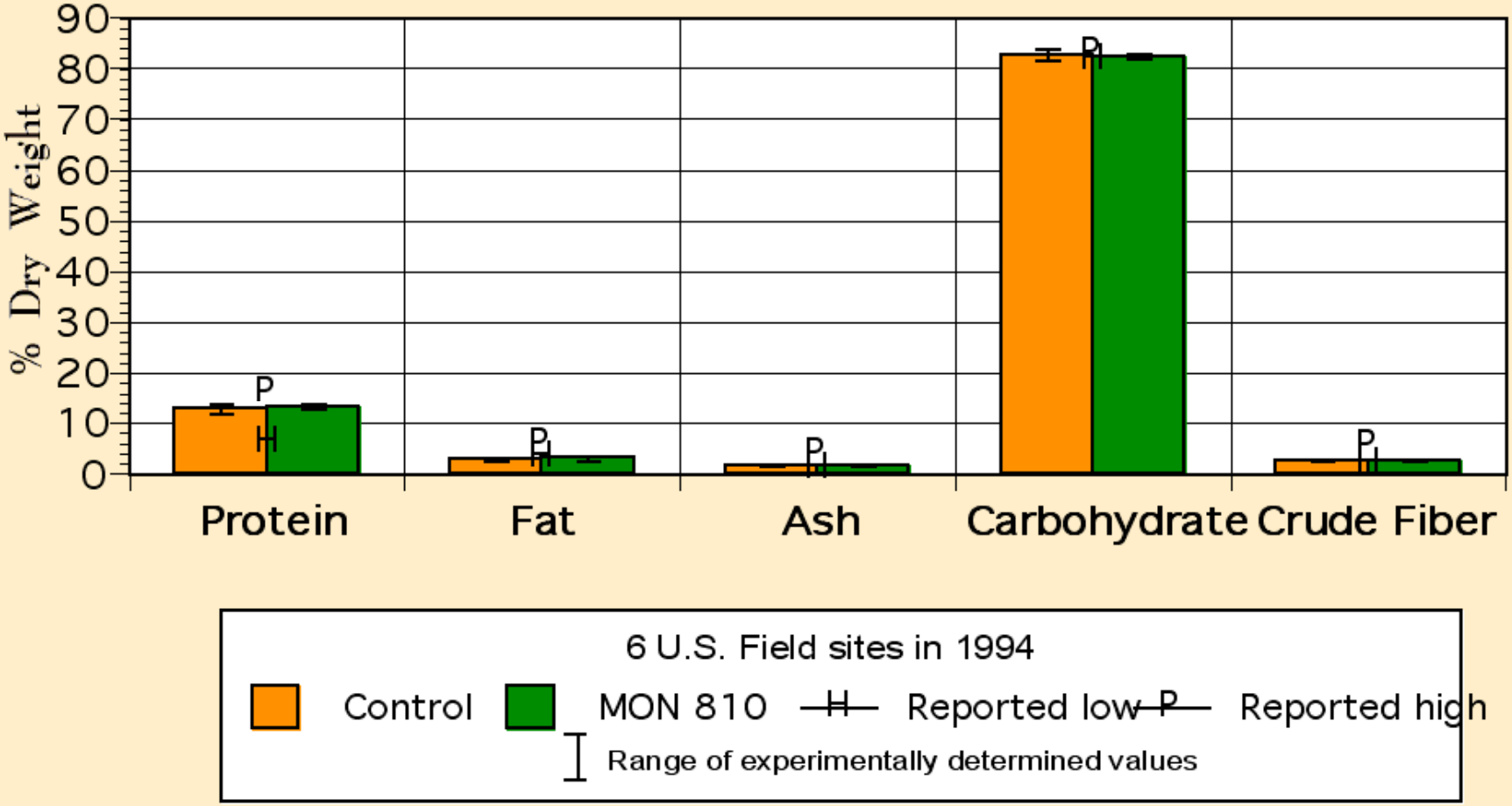
Concept of substantial equivalence

Analytical assessment of safety of new food relative to existing

Three outcomes:

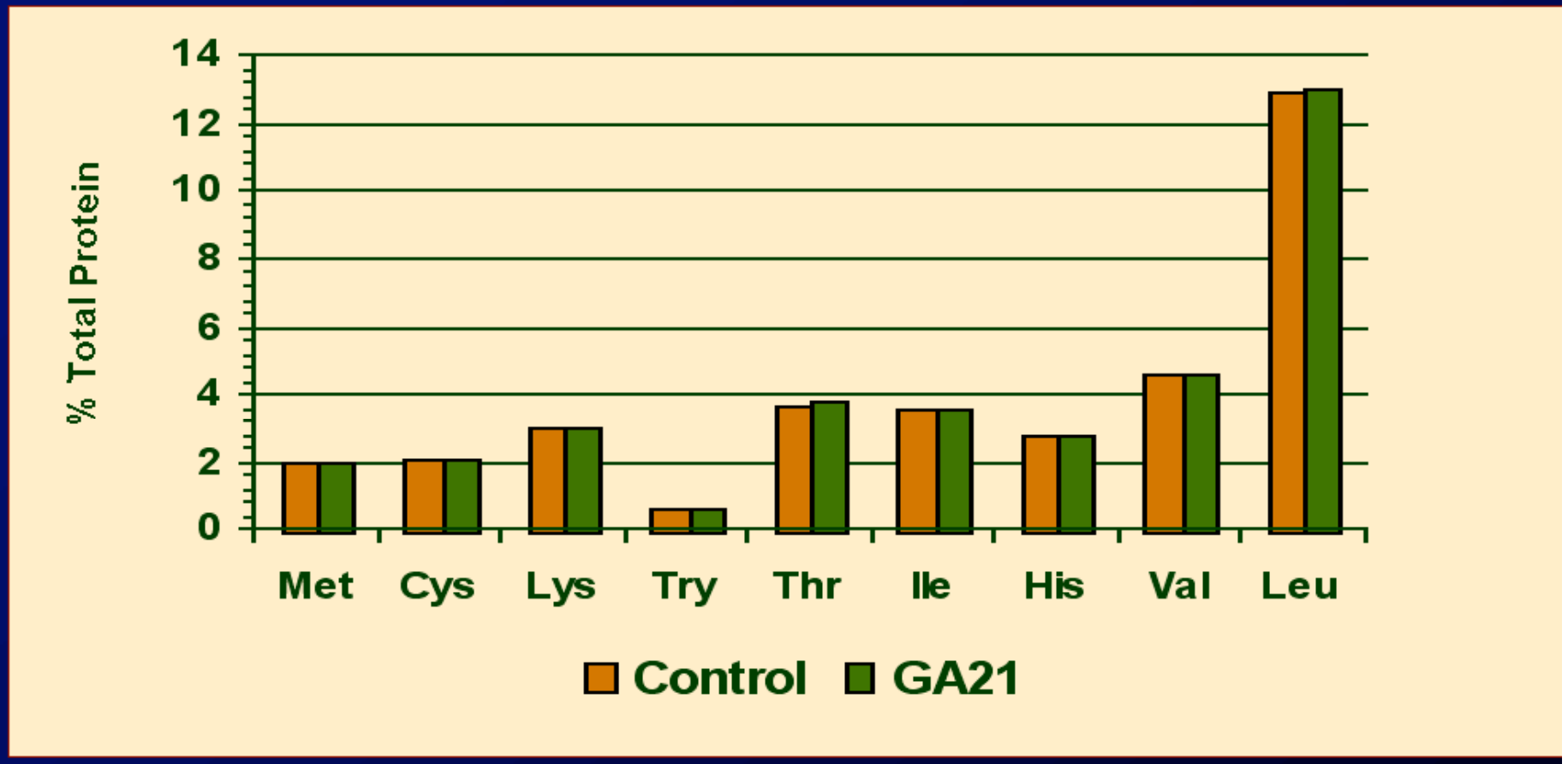
- GE food substantially equivalent to conventional
- GE food substantially equivalent to conventional except defined differences: toxicity or allergenicity of novel pr
- GE food not substantially equivalent to conventional

Compositional Equivalence: Proximate Analyses



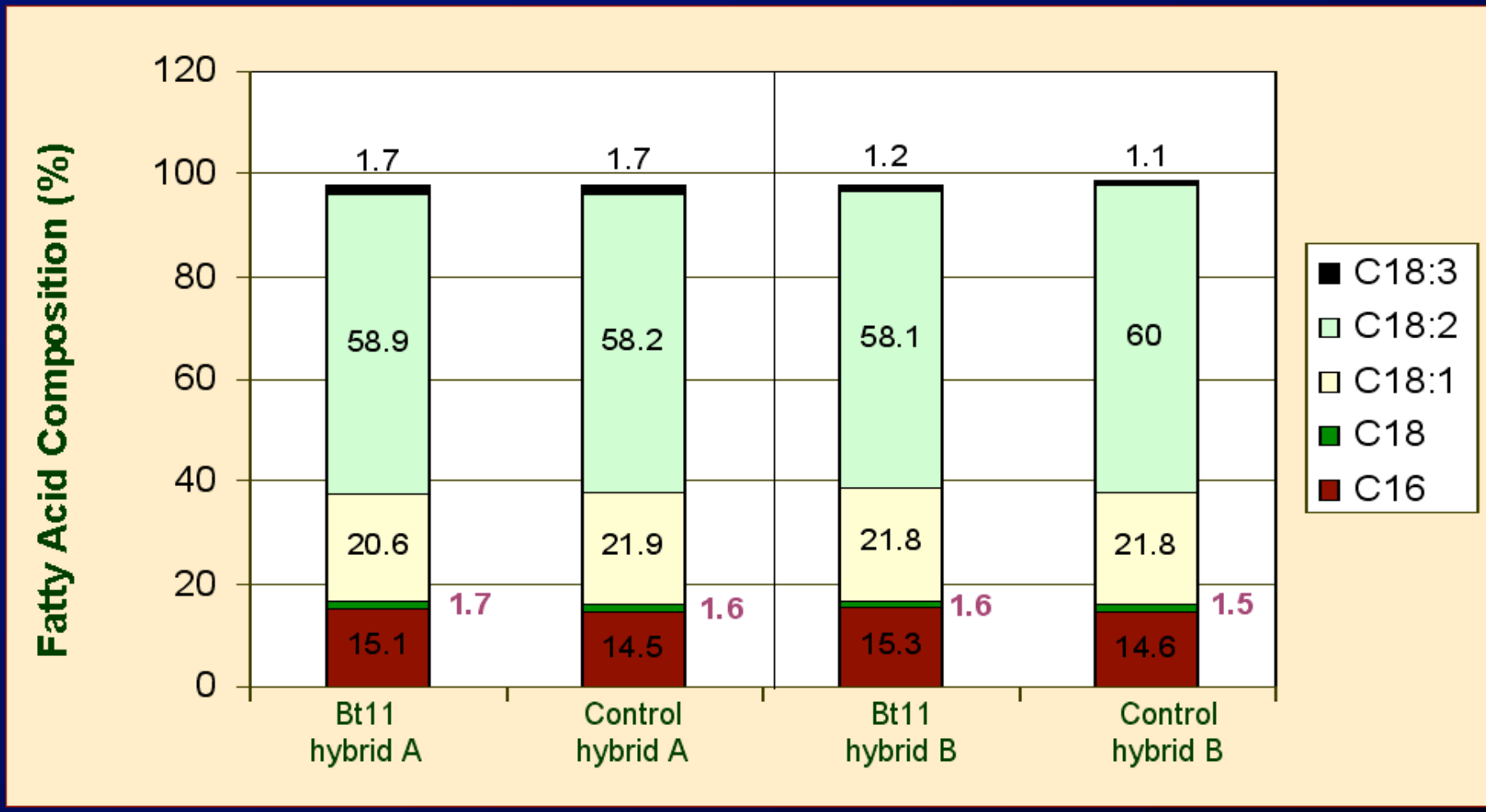
These results have been generated on Event MON810. Data showing similar proximate analyses have been generated on the other corn events.

Compositional Equivalence: Amino Acids



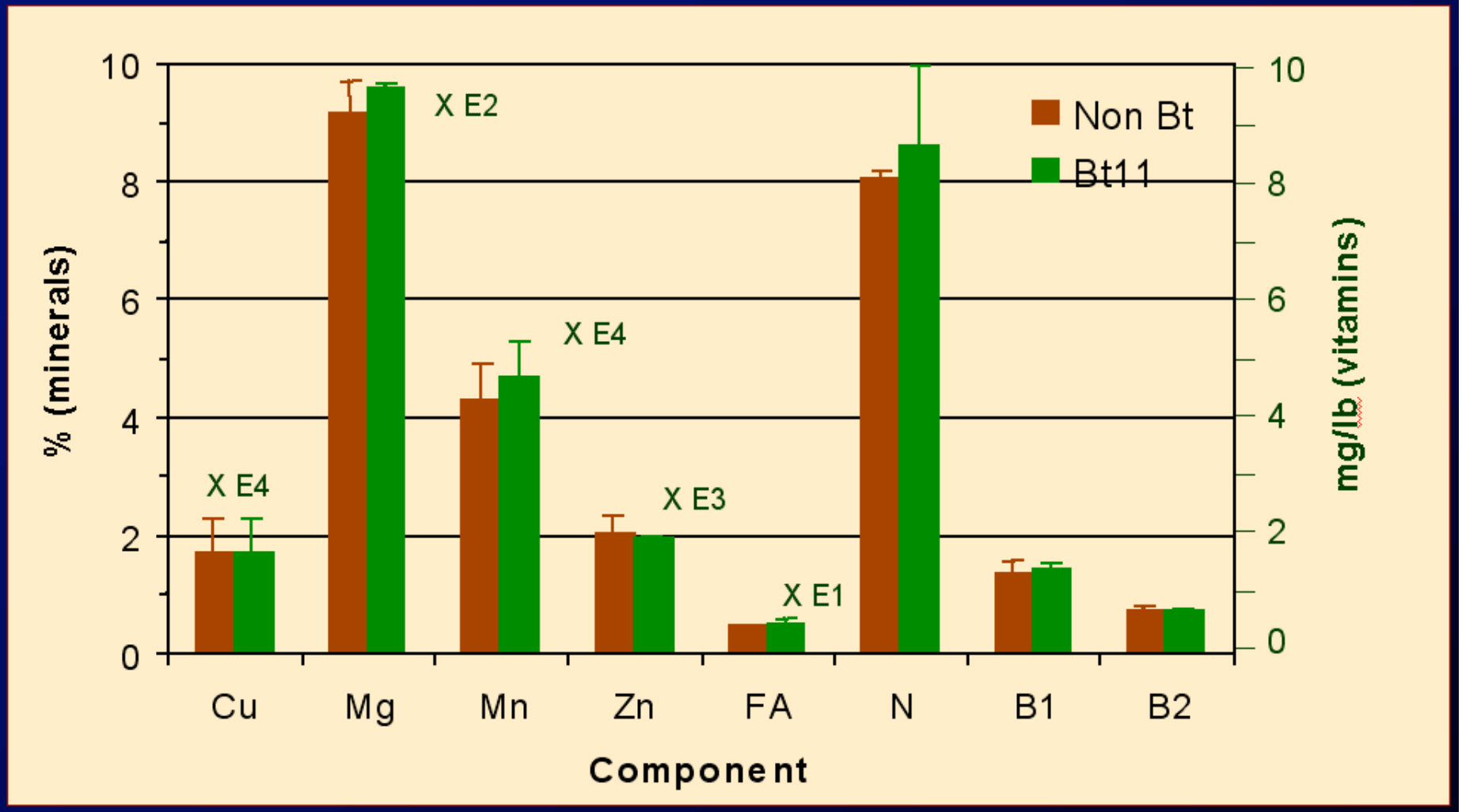
These results have been generated on event GA21. Data showing similar amino a composition have been generated on the other corn events.

Compositional Equivalence: Fatty Acids



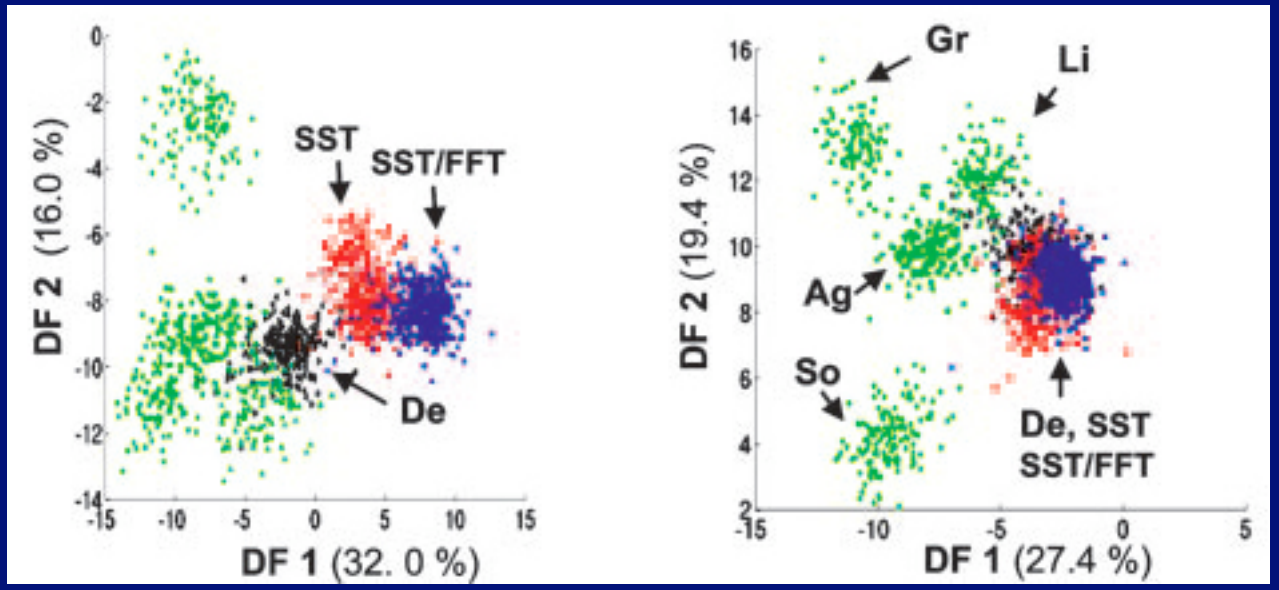
These results have been generated on Event Bt 11. Data showing similar fatty acid composition have been generated on the other corn events.

Compositional Equivalence: Mineral and Vitamin



These results have been generated on event Bt11. Data showing similar mineral and vitam composition have been generated on the other corn events.

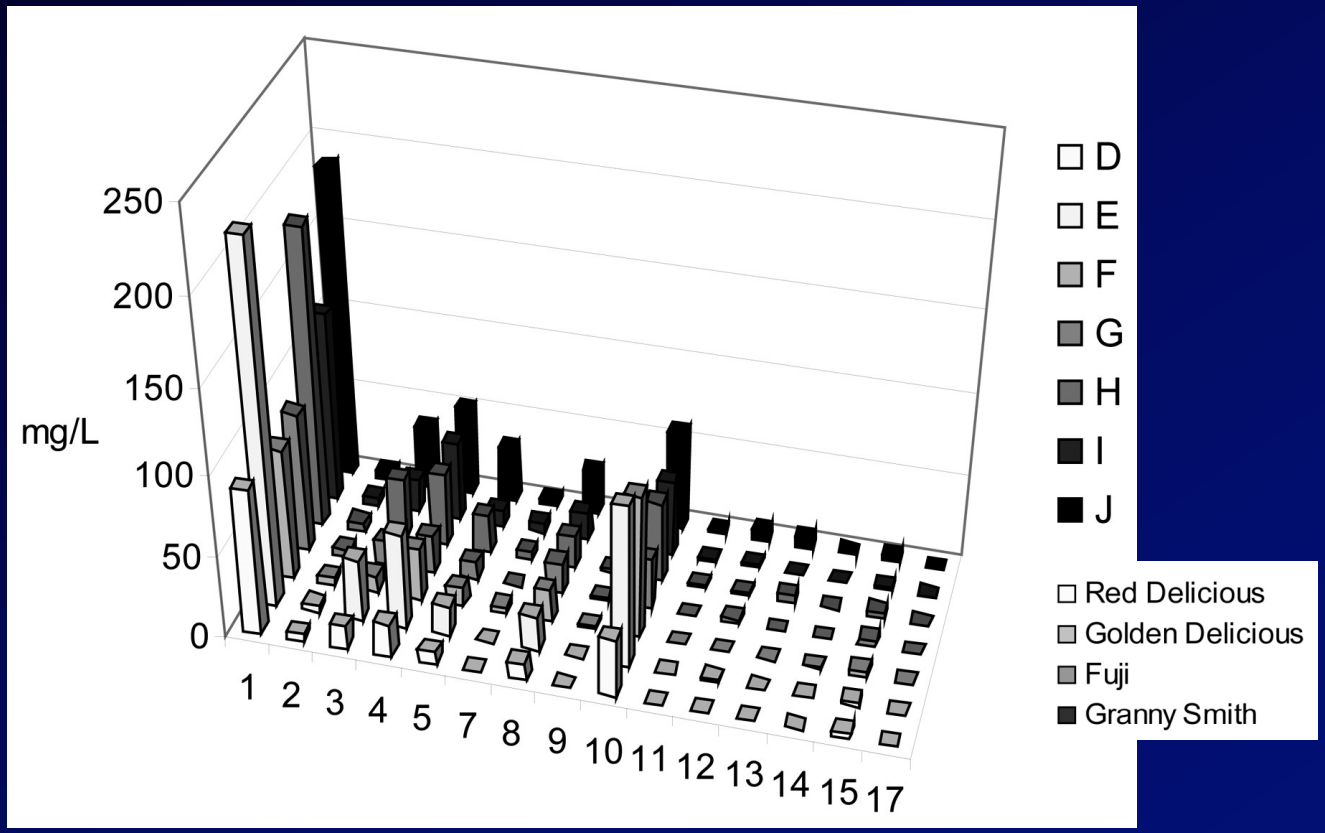
Hierarchical metabolomics demonstrates substantial compositional similarity betwee genetically modified and conventional potat



"…apart from targeted changes, these GM potatoes in this st appear substantially equivalent to traditional cultivars."

SOURCE: Catchpole et al. 2005. Hierarchical metabolomics demonstrates substantial compositional similarity between genetically modi and conventional potato crops. Proceedings of the National Academy of Sciences USA 105: 14458-144

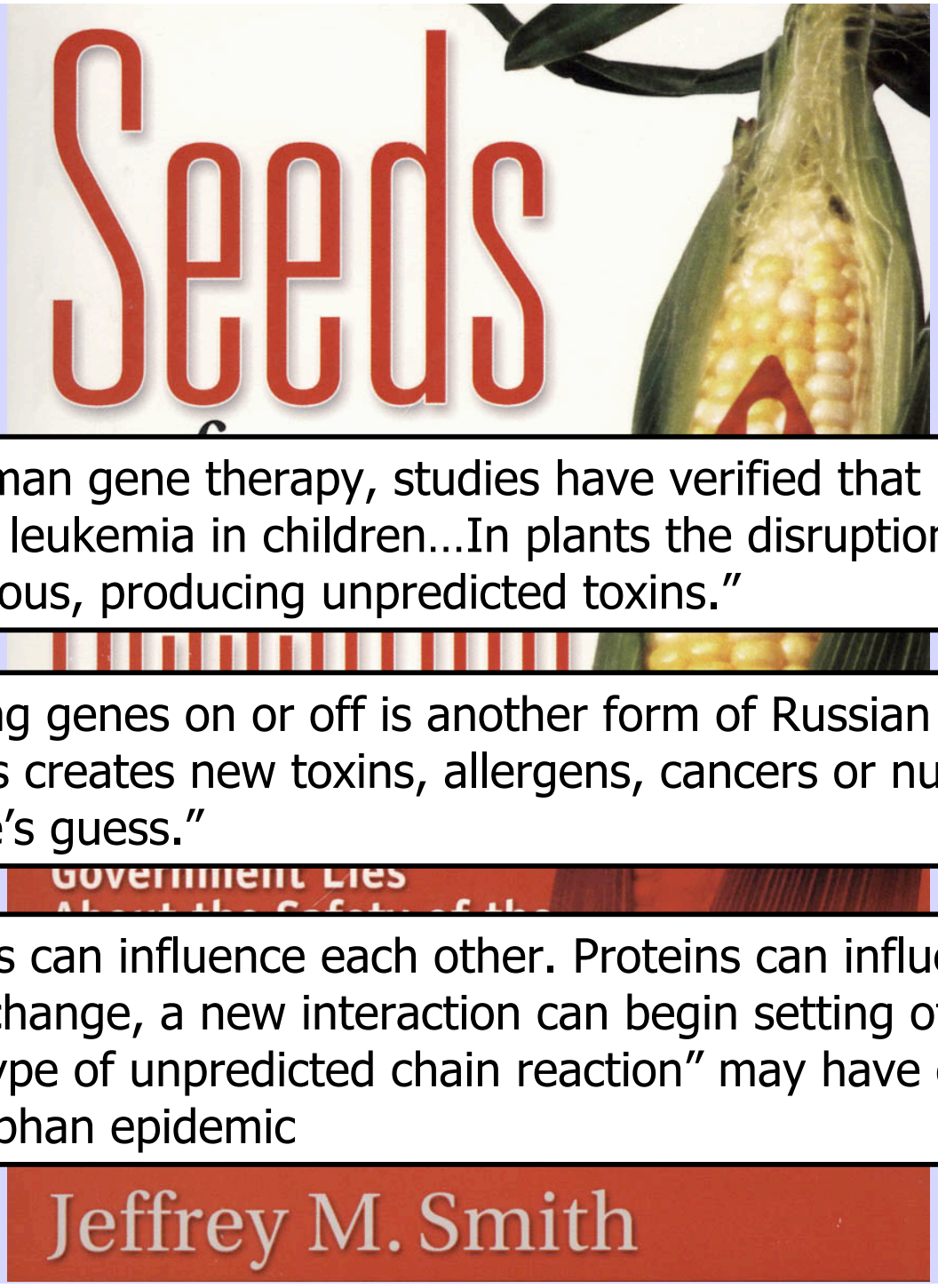
Polyphenol content in the juices freshly mad from eleven apple cultivars varied significan



Polyphenol profile (mg/L) of juices freshly made from dessert apple cultivars determined by HPLC-DAD analysis (for details see Section 2). 6 and 16 were not detectable. Numbering corresponds to that given in Section 2.

SOURCE: Kahle et al. 2005. Polyphenol profiles of apple juice. Mol. Nutr. Food Res 49:797-806


The HORROR
of Genetically
Engineered Food
IT Came from the Grocery Stor
You Can't Avo
It Because It
NOT LABEL
GREENPEAC
From the LABS of Monsanto to YOUR TABL
A NEW LIFE FORM Released into the World



"In human gene therapy, studies have verified that insertion mutation can lead to leukemia in children…In plants the disruptions may be similarly dangerous, producing unpredicted toxins."

"Turning genes on or off is another form of Russian roulette. Whether the process creates new toxins, allergens, cancers or nutritional changes is anyone's guess."

"Genes can influence each other. Proteins can influence each other. With each change, a new interaction can begin setting off yet more changes. This type of unpredicted chain reaction" may have caused the 'deadly' tryptophan epidemic

What are some food safety issues?

- No peer-reviewed food safety tests
- Creation of allergens or activation of toxins
- Pharma crops contaminate food supply
- Labeling
- Changes in nutritional content
- Gene flow from food to intestinal bacteria; increase in antibiotic resistance

What are some food safety issues?

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Difficulties with food safety testing
What to do and how to do it?

"It is difficult if not impossible to test food safety of whole foods and feeds with animal tests. Despite what non-experts commonly think, animal tests are not the gold standard. Compositional analysis and toxicity testing of individual components is much more sensitive than whole foods testing."

"Nutritional and Safety Testing of Foods and Feeds Nutritionally Improved through Biotechnology" 2004. *Comprehensive Reviews in Food Science and Food Safety,* ILSI

"There are publications on the toxicity and animal testing of Bts and at leas 112 studies of food safety of GM crops in animals."

Bruce Chassy, Chair, Department of Food Science and Human Nutrition, University of Illinois

"Preventing adverse health effects…requires application of appropriate scientific methods to predict and identify unintended compositional chang that may result from genetic modification of plants, animals and microbes However "it is the final product…rather than the modification method or process, that is more likely to result in unintended adverse effects."

National Academy of Sciences report, …"Safety of Genetically Engineered Foods: Approaches to Unintended Health Effects" (2004)

Poultry and Egg Study: Bt Protein Analysis

- 14 day poultry feeding study
- Diet: contained 64% grain (Bt or non Bt)
- Eggs collected on days 13 & 14
- Muscle and liver samples collected on day 14

Tissue	Bt Protein Analysis
white muscle (10)	Not detected
dark muscle (10)	Not detected
liver (10)	Not detected
egg whites (10)	Not detected
egg yolk (10)	Not detected

NE Beef and Dairy* Study: Bt Protein and DNA Analysis

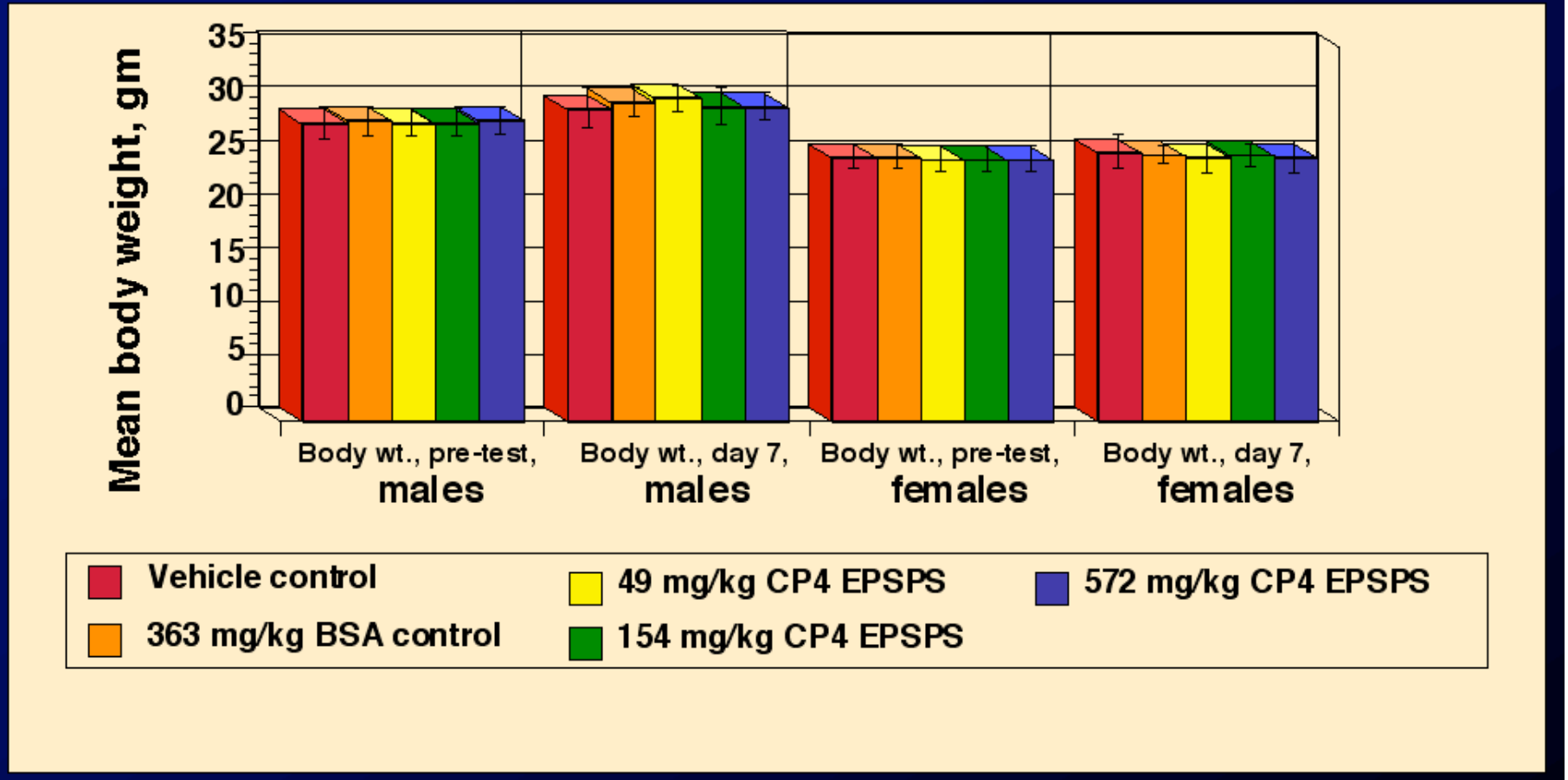
Tissue	Bt DNA	Bt Protein
➢muscle (24)	Not detected	Not detected
➢spleen (24)	Not detected	Not detected
➢whole milk (11)	Not detected	Not detected

What are some food safety issues?

- No peer-reviewed food safety tests
- Creation of allergens or activation of toxins
- Pharma crops contaminate food supply
- Labeling
- Changes in nutritional content
- Gene flow from food to intestinal bacteria; increase in antibiotic resistance

Toxicity Assessment: Roundup Ready/CP4 EPSPS protein

No deleterious effects at highest dose (572mg/kg)



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http://www.organicconsumers.org/ge/BT031706.cfm

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Organic Consumers Association

Campaigning for Food Safety, Organic Agriculture, Fair Trade & Sustainability

BECOME A MEMBER

News | About OCA | Action | Join/Subscribe | Campaigns | Search | Find Organics

Gene-Altered Bt Crops Threaten Public Health

Immune Responses and Skin Sensitization to Bt in Farm Workers and Presence of Bt in Many Genetically Engineered foods

Letters from NEIL J. CARMAN, PH.D.
Clean Air Program Director
Lone Star Chapter Sierra Club (Texas)

"Conversely, results of this investigation should partially allay recent concerns about the occurrence of possible adverse health effects in consumers after exposure to transgenic foods. Because reactivity to the Btk pro-delta-endotoxin was only encountered in 2 of 123 worke sensitized by the respiratory route, it is unlikely that consumers would de allergic sensitivity after oral exposure to transgenic foods (e.g., tomato potatoes) that currently contain the gene encoding this protein.

(Bernstein et al. 1999. Environ Health Perspect 107:575-582)

spray in GE food consumers.

A health survey was conducted in farm workers before and after exposure to Bt pesticides. The investigation included questionnaires, nasal/mouth lavages, ventilatory function assessment, and skin tests to indigenous aeroallergens and to a variety of Bt spore and vegetative preparations. To authenticate exposure to the organism present in the commercial preparation, isolates from lavage specimens were tested for Bt genes by DNA-DNA hybridization

Inadvertent Creation of Allergens and Toxin

Toxin Creation Confined to GE Foods?





No – naturally occurring toxins occur as a result of classical breeding efforts, *e.g.*, potato (glycoalkaloids) and celery (psoralens)

Allergy Creation Confined to GE Foods?

Classically bred foods cause allergy problems also – the case of the Kiwi



Long-term Food Safety Studies Should They Be Done, How and on What Foods?

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http://www.nokomisnutrition.com/l-tryptophan%20capsules.htm

1992

Nokomis Nutrition

Nutritional supplement, L-tryptophan, made by G bacteria, caused 37 deaths in late 80's

L-Tryptophan, USP

What caused the problem?

A Pharmaceutically Pure Amino Acid

Nutritional Supplement

Flaxseed

NOW Vitamins

Trace Minerals

Phyto's / Greens

Never conclusively linked to either the new strain o bacteria used or manufacturing process, which eliminated certain filtration steps; both occurred a time of deaths. Reconstruction experiments indicate causative impurity was not related to GE technolog

Pusztai rat feeding studies

(Ewen SW and Pusztai A "Effect of diets containing genetically modified potatoes expressing *Galanthus nivalis* lectin on rat small intestine. Lancet354:1353-1354)



Were the studies conclusive? Were they relevant to other GE crops?

In late 90's rats fed potatoes engineered with snowdrop lectin. Claims that stomach damage due to lectins and other parts of genetic construct. Scientific community concluded too few animals were used and inadequate controls; experiments should be repeated. Product was never marketed.

Fumonisin Reduction with Bt-maize



- 1989: High levels of fumonisin cau large-scale outbreaks of lethal lun edema in pigs, brain tumors in ho
- Fumonisin contamination caused insect infestation
- 20- to 30-fold fumonisin reduction Bt-maize

●Hammond, B. et al., (Feb. 2004), *Lower fumonisin mycotoxin levels in the grain of Bt-corn grown in the United States in 2000-2002*, J. Agric. Food Chem. 52: 1390-1397

Modified from Drew L. Kershen
University of Oklahoma

Starlink corn contamination



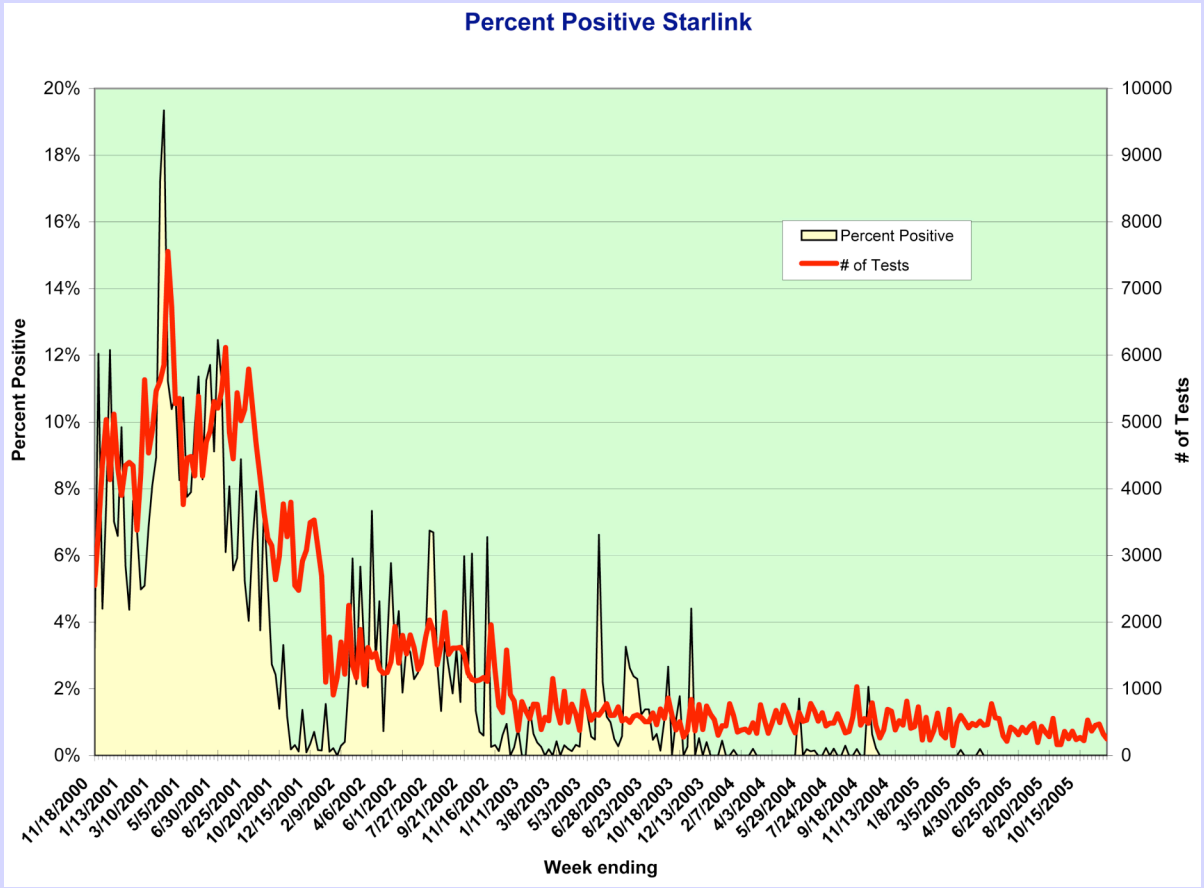
Kraft Food recalls all taco shells sold nationwide under Taco Bell Brand

SOURCE: Washington Post, September 19, 2000



StarLink Corn

- *Bt*-corn approved for animal feed only due to lack of allergenicity testing
- Oct 2000: StarLink *Bt* gene found in foods, forcing massive food recalls
- 51 people complained of allergic reactions
- Immunological studies conducted; samples of food from consumers found no StarLink
- Starlink removed from market



Percentage of Positive Starlin	
Week ending:	
November 25, 2000	12.05%
November 30, 2002	1.19%
November 1, 2003	0.26%
November 27, 2004	0.00%
April 16, 2005	0.19%
May, 2005	0.00%
June, 2005	0.00%
July, 2005	0.00%
August, 2005	0.00%
October, 2005	0.00%
November, 2005	0.00%
December, 2005	0.00%

Zimbabwe and Zambia stand united on GM



THE HERALD (Harare) Wisdom Mdzungairi
October 11, 2005

International scientists, including those from the Unit
States, have praised Zimbabwe and Zambia for reject
genetically-modified food donations from the West to

**But fears of Starlink contamination stil
linger about exports to Africa**

Council of Zambia, said "Extreme views have tended
confuse many African policymakers and the public
because of lack of reliable information and guidance
available to the groups."

What are some food safety issues?

- No peer-reviewed food safety tests
- Creation of allergens or activation of toxins
- **Pharma crops contaminate food supply**
- Labeling
- Changes in nutritional content
- Gene flow from food to intestinal bacteria; increase in antibiotic resistance

The Washington Post

November 14, 2002

Biotech Firm Mishandled Corn in Iowa

By Justin Gillis

The biotechnology company that mishandled gene-altered corn in

Production of pharmaceuticals in edible crop
cause concern

U.S. Department of Agriculture ordered 155 acres of Iowa corn pul
up in September and incinerated.



Corn engineered with protein that kills sperm

SOURCE: Capital Press, November 2001. "Contraceptive corn, healthful tobacco: 'Pharming' takes root

The Mercury News

March 30, 2004

'Pharm crop' debate takes root in California Biotech

April 2004
California company seeks to grow Pharma rice expressing two proteins from animal genes, lysozyme and lactoferrin

YU
qua
inte

Sac
make two human proteins, normally found in breast milk and tears, for use in treati
human illnesses.

If it gets the necessary approvals, the decade-old company would become the first



USDA Agricultural Marketing Service has proposed amendments to the NOP to add fifte substances, along with any restrictive annotations, to the National List.

The fifteen substances are:

* Use of Ferric Phosphate as slug or snail bait;
* Use of Glycerine Oleate (Glycerol monooleate) as an anti-foaming agent (defoamer) in Pesticide Formulations;
* Use of Tetrahydrofurfuryl alcohol in Passive Pheromone Dispensers;
* Use of Hydrogen Chloride for Delinting of Cotton Seed -

The following substances may be used " ... as ingredients in or on processed products labeled as 'organic' or 'made with organic (specified ingredients or food group(s)):

* Egg white lysozyme
* L-malic acid
* Microorganisms--any food grade bacteria, fungi, and other microorganism
* Activated charcoal
* Ammonium hydroxide
* Cyclohexylamine as a boiler water additive for packaging sterilization. O.K. for products labeled 'made with organic (specified ingredients or food group(s));' prohibited in handling agricultural products labeled 'organic'
* Diethylaminoethanol - same as above
* Octadecylamine - same as above
* Peracetic acid/Peroxyacetic acid - used " ... in wash and/or rinse water as described abo
* Sodium acid pyrophosphate - used " ... as a leavening agent as described above
* Tetrasodium pyrophosphate - used "only in meat analog products as described above

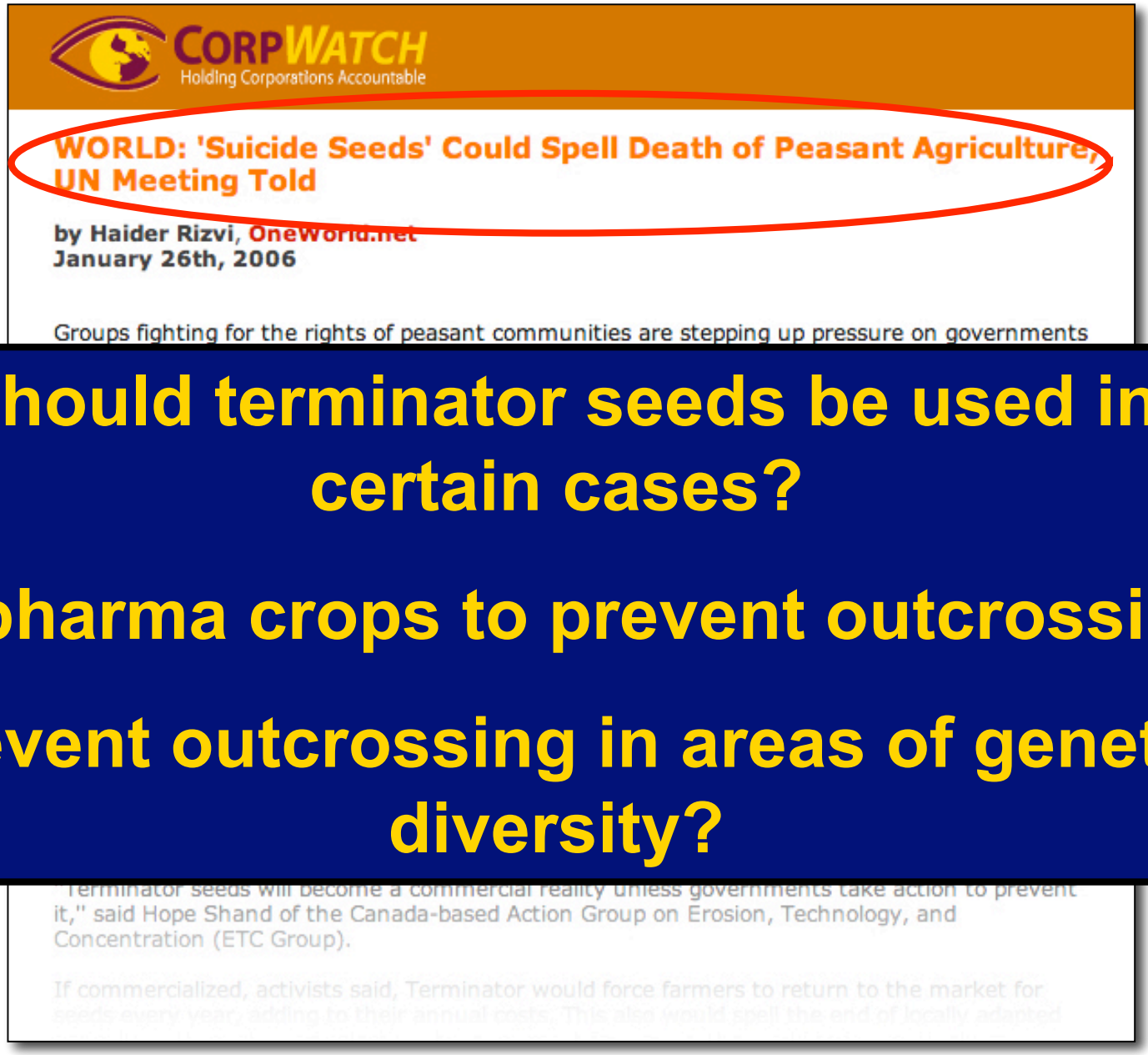
ProdiGene



- Planted soybeans in field previously used for testing transgenic corn.
- APHIS (USDA's Animal and Plant Health Inspection Service) discovered "volunteer" corn plants growing among soybeans. Instructed ProdiGene to remove the corn plants.
- Soybeans harvested before all the corn was removed, mixed with 500,000 bushels of soybeans.
- Soybeans destroyed, ProdiGene ordered to pay $250,000 civil fines, reimbursement for lost crops, and $1 million higher regulatory fees.

USDA tightens rules on Pharm/Industrial Cro

- Crop inspection 7 times; 5 in growing season, 2 after harvest
- Field isolation distances increased
- Dedicated farm equipment required
- Permits required for industrial crops, like pharm crops



Should terminator seeds be used in certain cases?

For pharma crops to prevent outcrossing?

Prevent outcrossing in areas of genetic diversity?

SOURCE: http://www.corpwatch.org/article.php?id=13

What are some food safety issues?

- No peer-reviewed food safety tests
- Creation of allergens or activation of toxins
- Pharma crops contaminate food supply
- Labeling
- Changes in nutritional content
- Gene flow from food to intestinal bacteria; increase in antibiotic resistance

Why Doesn't FDA Have a Labeling Policy for GM Foods?

Actually it does…

Foods produced through biotechnology are subject to the sa labeling laws as all other foods and food ingredients

Information on label pertains to composition and attribu of food, not to agricultural or manufacturing practice

No label needed if food essentially equivalent in safety, composition and nutrition

GM food labeled if different nutritional characteristics, gen material from known allergenic source (*e.g.*, peanut, wheat or elevated levels of antinutritional or toxic compounds

Should fresh produce items, packages or displays be labeled to identify…? Summary of "yes" responses

Nutritional value	77.1%
Country of origin	85.9%
Chemicals used in production	90.7%
Organically grown	86.0%
Irradiated	77.8%
Use of biotechnology	78.4%
Use of waxes and/or coatings	84.5%

SOURCE: Fresh Trends 2002 (courtesy of Roberta Cook, UC

Why not just label?



Putting a label on a whole food is relatively easy, but



Processed foods are different, tomato sauce that can use 8 or r different varieties – which wo require tracking that could be c



May contain genetically modified tomatoes



Contains genetically modified tomatoes



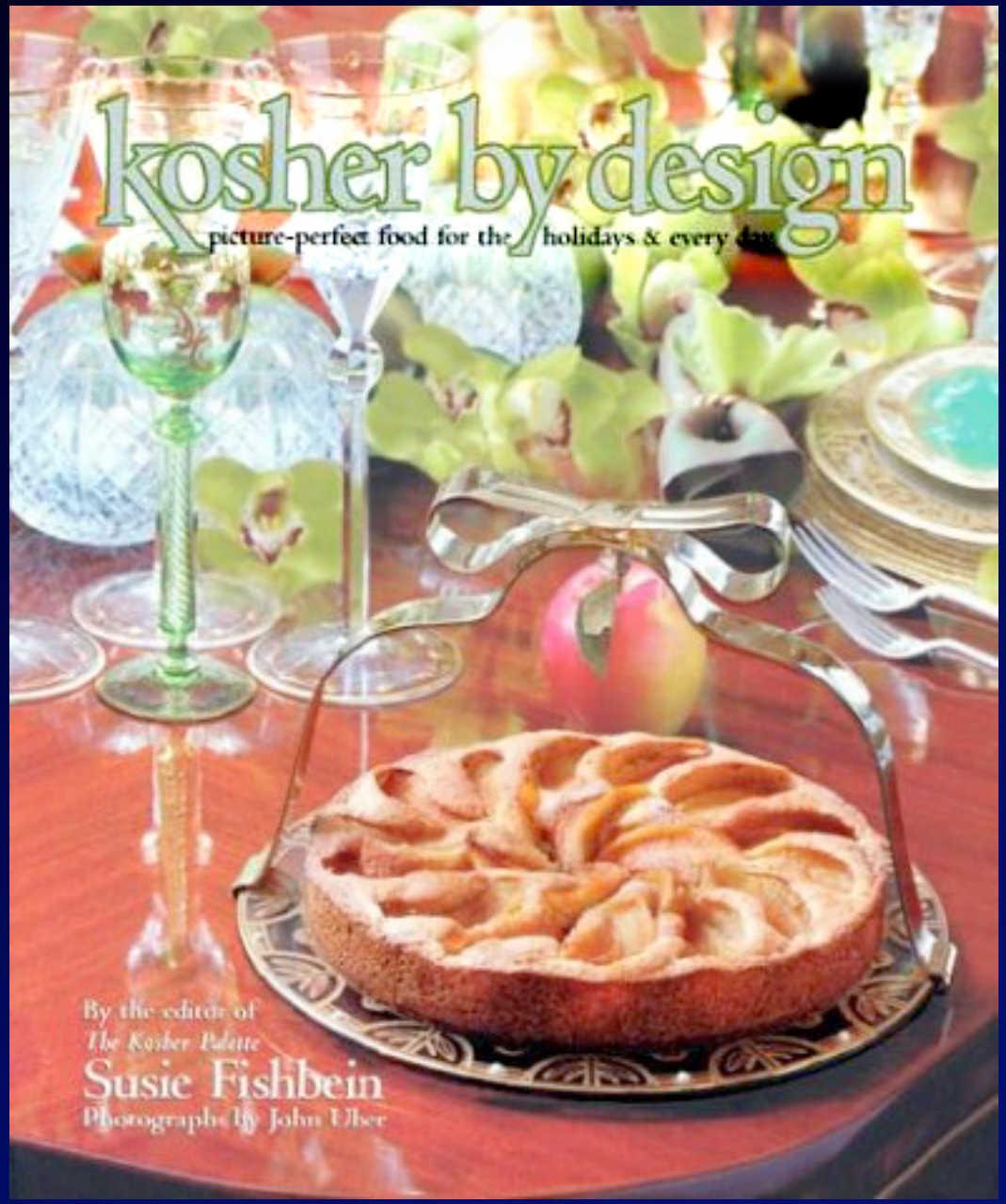
Contains tomatoes genetically modifie with polygalacturonase gene from tomato, phosphinothricin acetyl trans-ferase from *Streptomyces hygroscopicus*, crystal toxin from *Bacillus thuringiensis*, alpha amylase gene from barley, s-adenosyl methion ine transferase gene from tobacco, N protein gene from tobacco, coat prote gene from tomato bushy stunt virus

But there are foods that are tracked for consumer choice… like organic and…





…Kosher



Should everyone a premiu price for free foods

For which people pay premium prices

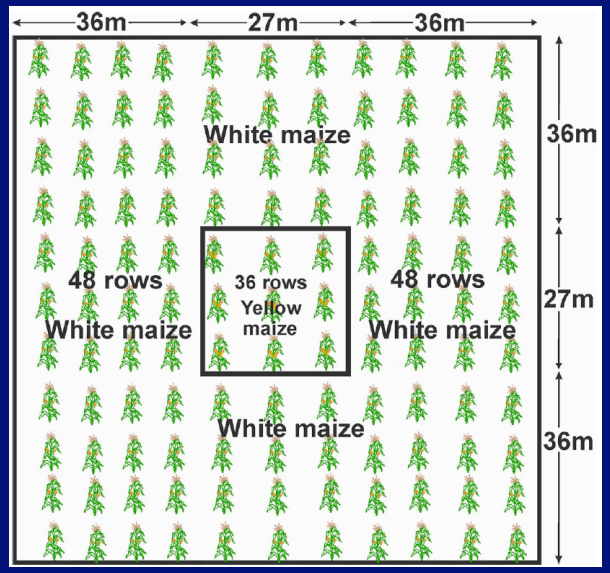
What are some environmental issues?

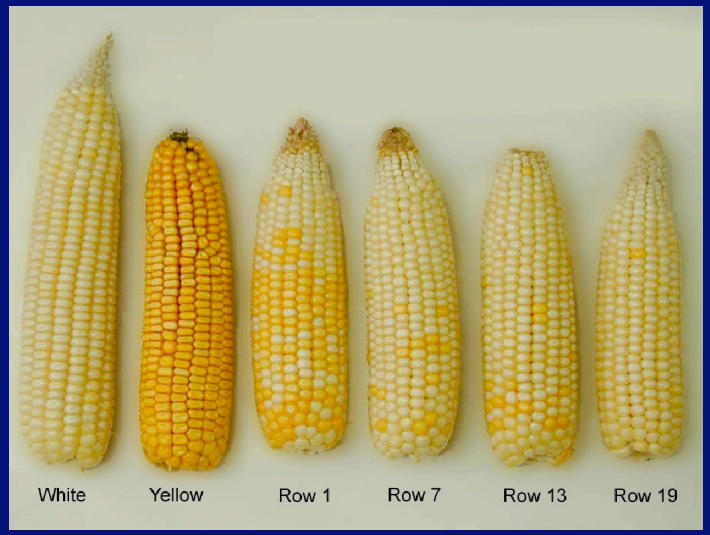
- Gene flow via pollen flow to generate superwe (herbicide tolerance to wild/weedy species)
- Transfer of transgenes to non-GMO / organic c
- Loss of genetic diversity?
- Property rights (gene patents)?
- Spread of pharmaceutical genes into commer crops?

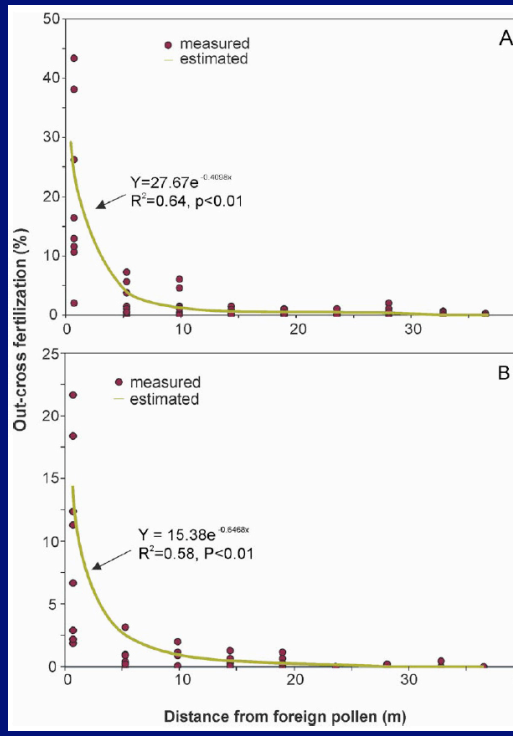
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Pollen Drift of GE Corn







SOURCE: Ma, B.L. 2005. Frequency of Pollen Drift in Genetically Engineered Corn. ISB News Report, February 2005.

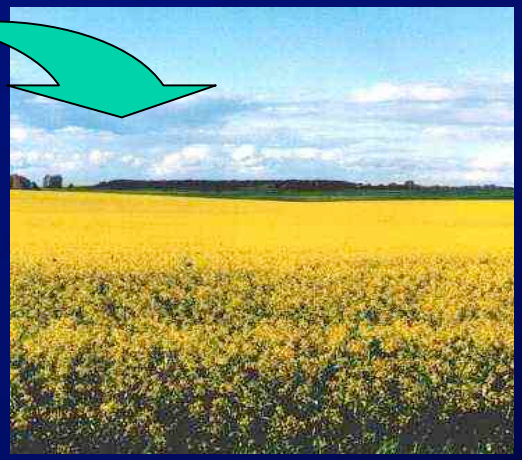
Pollen Flow Distances for Crop Species of Interest

Crop Type	Mode of Pollination	Means of Movement	Fdn Seed Prod Isolation Distance	Measure Pollen Movemnt Dstance
Alfalfa	Self-sterile; obligate outcrossing	Bees	900 ft (0.17 mi)	2000 ft (0.48 mi)
Bentgrass	Clonal (stolons); type outcrossing dep on environment	Wind	900 ft (98%purity) (0.17 mi)	13.05 mi
Canola	Predom. selfing; 30% outcrossing	Wind/insects	>1320 ft (0.25 mi)	1.9 mi
Corn	Almost exclusively outcrossing	Wind	660 ft (0.125 mi)	~2 mi
Cotton	Predom. Seslfing; outcrossing with insects	Insects	>1320 ft (0.25 mi)	n.a.
Rice	Self-pollinating (99.5%); pollen viable 3-15 min	Physical touching/wind	10 ft	30 ft
Squash	Obligate outcrossing	Insects (predom. bees)	1320 ft (0.25 mi)	0.8 mi
Soybean	Self-pollinating (99%)	Physical touching/wind	5 ft	n.a.
Wheat	Self-pollinating (99.9%)	Physical touching/wind	5 ft	>160 ft

Consequences of gene flow from GE crops to weedy species in fiel

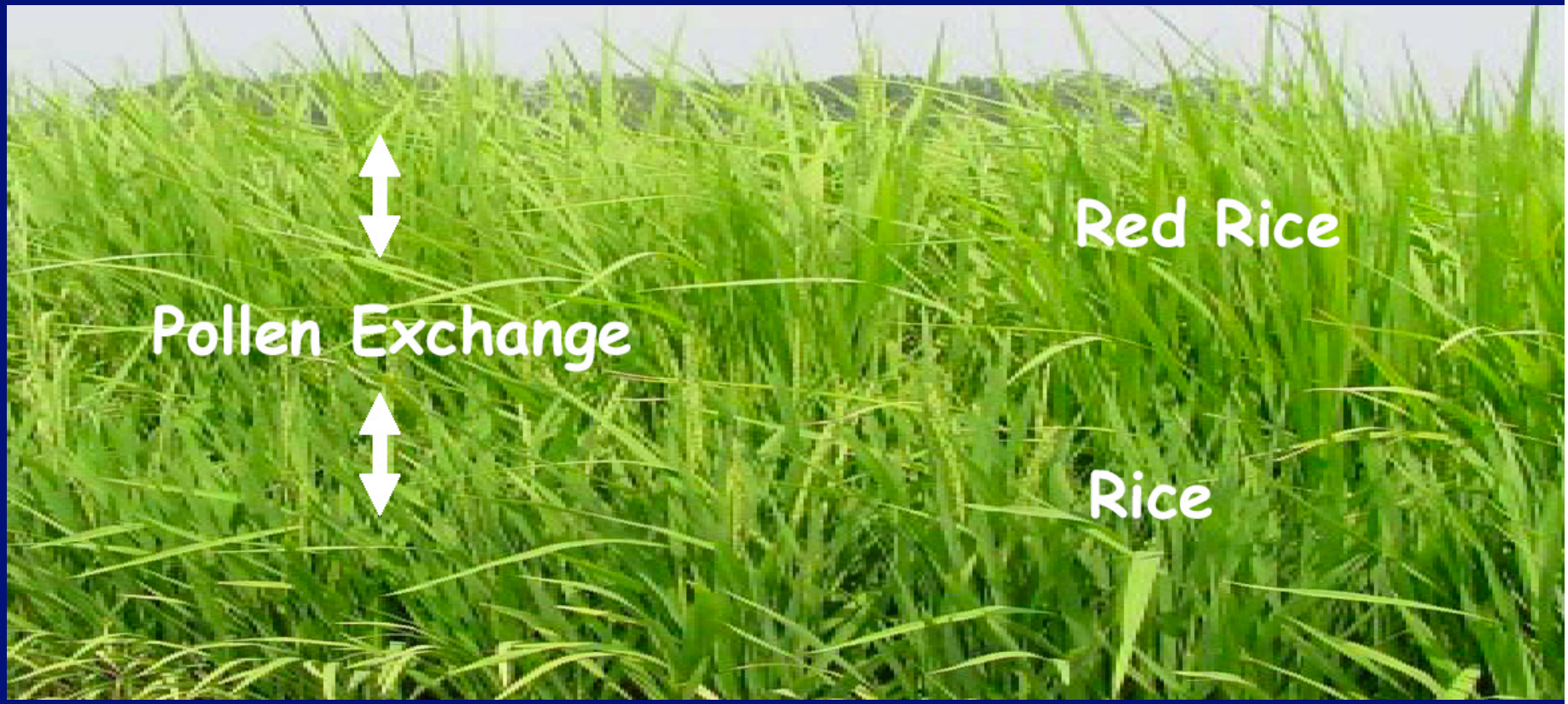


GM canola



non-GM canola

Question – What Are the Consequences of Gene Fl
Consider Vitamin A Genes vs. Herbicide Toleran
Genes from GE Rice to Weedy Red Rice



Pollen Flow between Herbicide-Tolerant Canola: Cause of Multiple Resistant Canola Variety







crossing



"Triple-resistant canc
(Two GE traits; one mutati
Hall et al. (2000)

Consequences of Triple-Resistant Canola and HT-Wild Hybrids?



canola

What is the actual risk?

- HT doesn't necessarily translate i increase in weediness
- HT gene only helps plant if you sp target herbicide
- Eventually can't use specific herbicide

Who stands to lose?

- Herbicide manufacturer
- HT plant developer
- Farmer

What are some environmental issues?

- Gene flow via pollen flow to generate superwe (herbicide tolerance to wild/weedy species)
- Transfer of transgenes to organic crops?
- Loss of genetic diversity?
- Property rights (gene patents)?
- Spread of pharmaceutical genes into commer crops?



Will an organic farmer automatically lose accreditation if his/her crop is found contaminated with a GE crop?

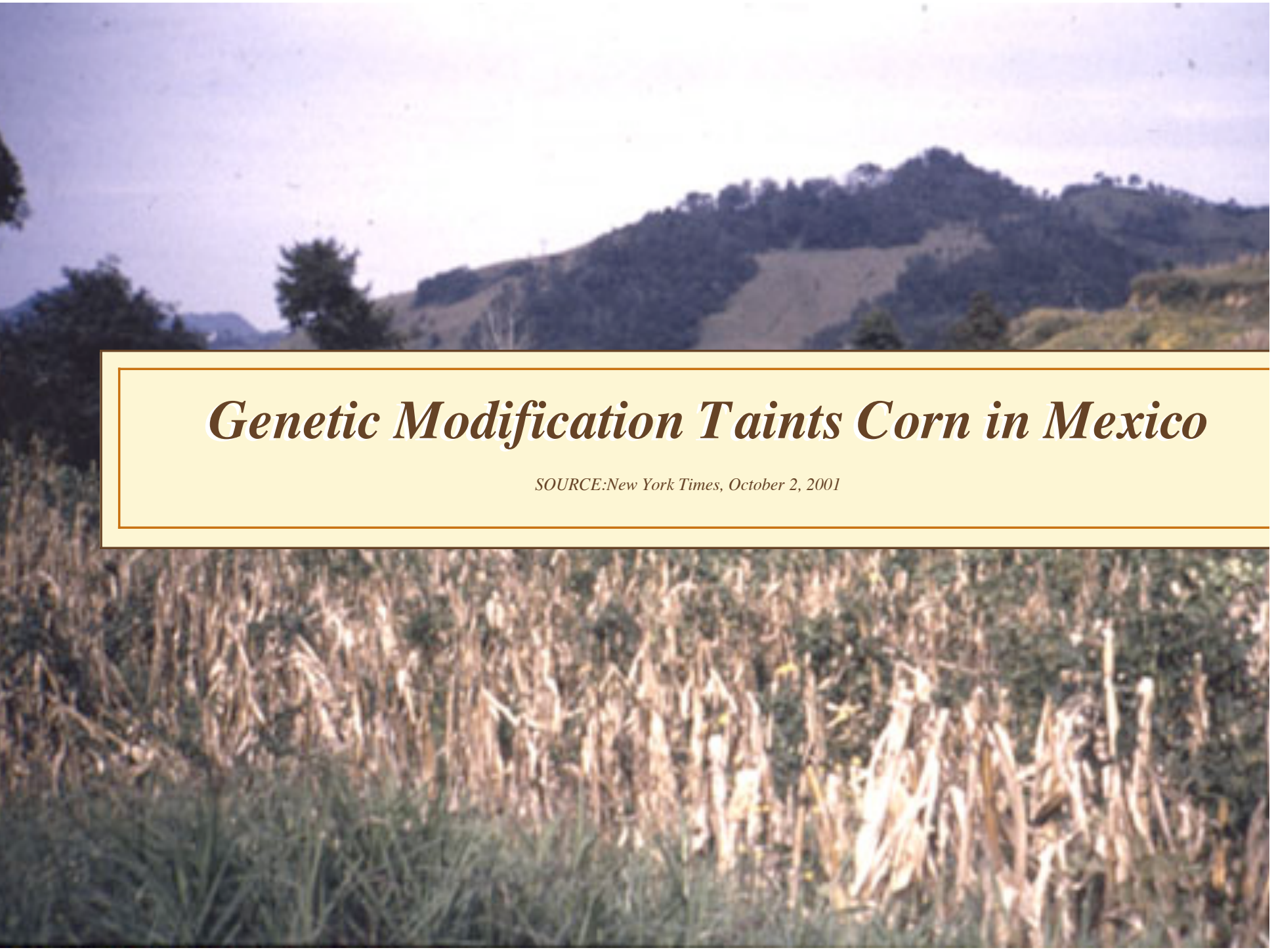
No.

"As long as an organic operation has not used excluded methods and ta reasonable steps to avoid contact with the products of excluded methods detailed in their approved organic system plan, the unintentional presen of the products of excluded methods should not affect the status of an organic product or operation."

SOURCE: AMS National Organic Program

What are some environmental issues?

- Gene flow via pollen flow to generate superwe (herbicide tolerance to wild/weedy species)
- Transfer of transgenes to non-GMO/organic cr
- Loss of genetic diversity?
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Genetic Modification Taints Corn in Mexico

SOURCE:New York Times, October 2, 2001

Gene flow in Mexican maize: consequences for genetic diversity



State of Jelisco



Near Amecameca in Chalco area

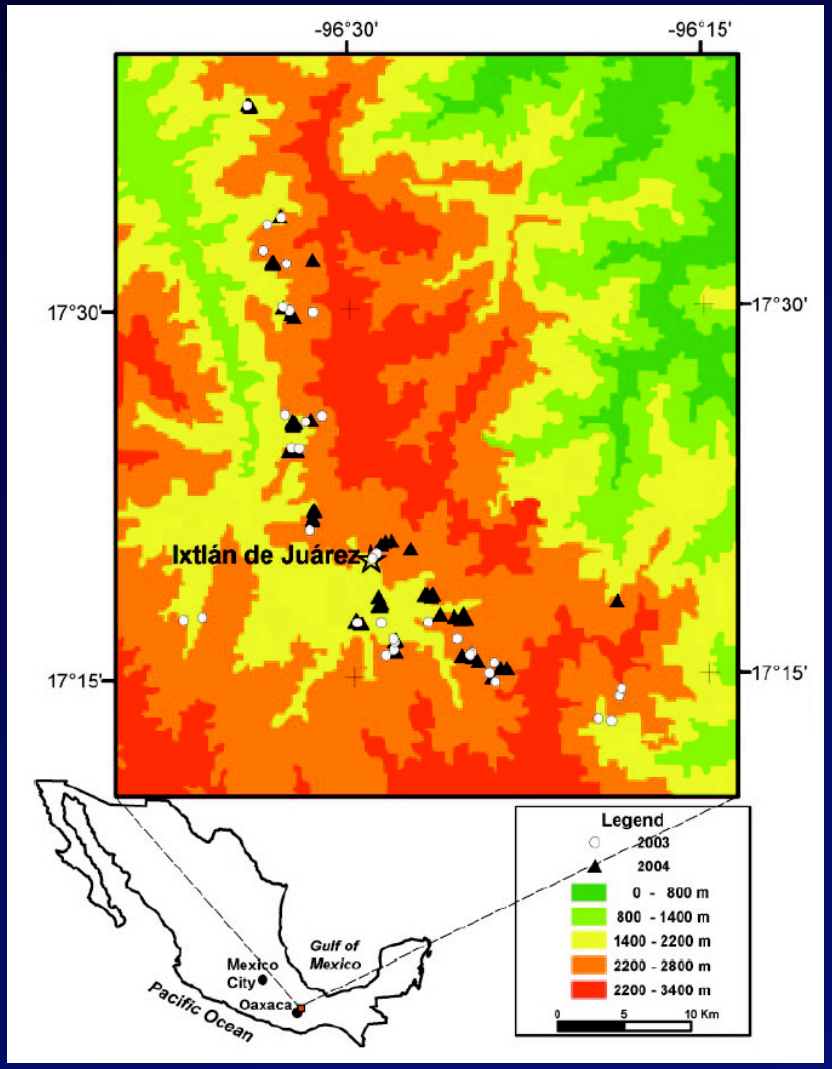
How does pollen and gene flow occur in Mexico?

Is this the first time gene flow has occurred into Mexican landraces?



What implications does transgene flow have for wild and domesticated maize?

Map of fields in Oaxaca, Mexico, where seeds wer collected from maize landraces in 2003 and 2004



No evidence GE corn foun in new study specific area Mexico wher evidence foun in 2001

SOURCE: Ortiz-Garcia et al. (2005) PNAS 102:12338-12343

Capital Press, September 16, 2005

Communicate to avoid pesticide drift, winemaker s

By MATEUSZ PERKOWSKI
Freelance Writer

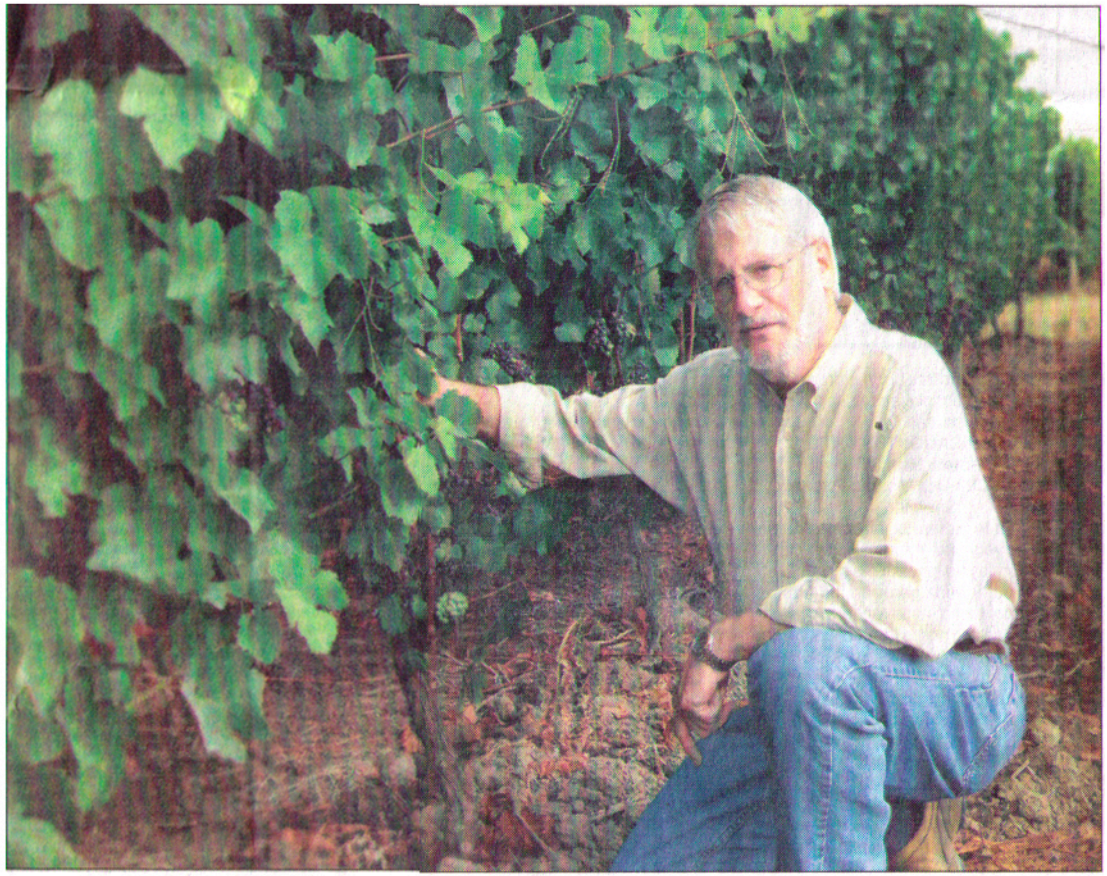
Fifteen years ago, David Adelsheim received some bad news. His vineyard manager had noticed that a section of his vineyard, located near Newberg, Ore., was producing vines with badly distorted leaves.

"Instead of being a full leaf shape, they might have been only half-a-leaf shape, or they were smaller and fanned together," said Adelsheim. All the symptoms pointed to one thing: the plants had been damaged by an herbicide.

As it turned out, a neighbor had sprayed half an acre of his land that was overgrown with blackberry bushes with a growth regulator herbicide containing 2,4-D. Aside from killing the blackberries, some of the herbicide had drifted onto the rows of grapevines growing only 15 feet away.

Roughly five acres were affected by the drift, which was about a third of Adelsheim Vineyards at the time. The first several rows were the most badly damaged, but even grapevines 30 rows down were showing some deformation. Because the neighbor had sprayed in mid-spring – after the grape bud break but prior to bloom – much of the year's crop had been aborted, and the remaining vines were too damaged to ripen any grapes.

In the decade and a half since then, Adelsheim Vineyards has managed to overcome the injury caused by the incident – the company has expanded to 180 acres, and the five acres ravaged by the herbicide have largely recovered. Nonetheless, Adelsheim said the effects of the



MATEUSZ PERKOWSKI/For the Capital Press

David Adelseheim examines some grapes at his vineyards near Newberg, Ore. Fifteen years ago, herbicide drift damaged several acres of his grapevines, and Adelsheim said the affected plants have never fully recovered.

One of the most divisive issues regarding genetic engineerin is the thought that a choice must be made between EITHER "organic agriculture" OR "GMOs".

As long as these issues are polarized into "all is permitted" "nothing is permitted", rational social discussion is impossible.

Dualism (right versus wrong) makes compromise difficult

Co-existence

development of best management practices to minimize adventit presence of unwanted material and effectively enable differe production systems to co-exist to ensure sustainability an viability of all production systems.

General concept of co-existence is well-established in California conventional, organic and IPM systems working together.