

**Plant
Biotechnology
2002 and
Beyond 10th
IAPTC&B
Congress
ORLANDO, FL.
23-28. 6. 2002**

**Klaus
Ammann:**



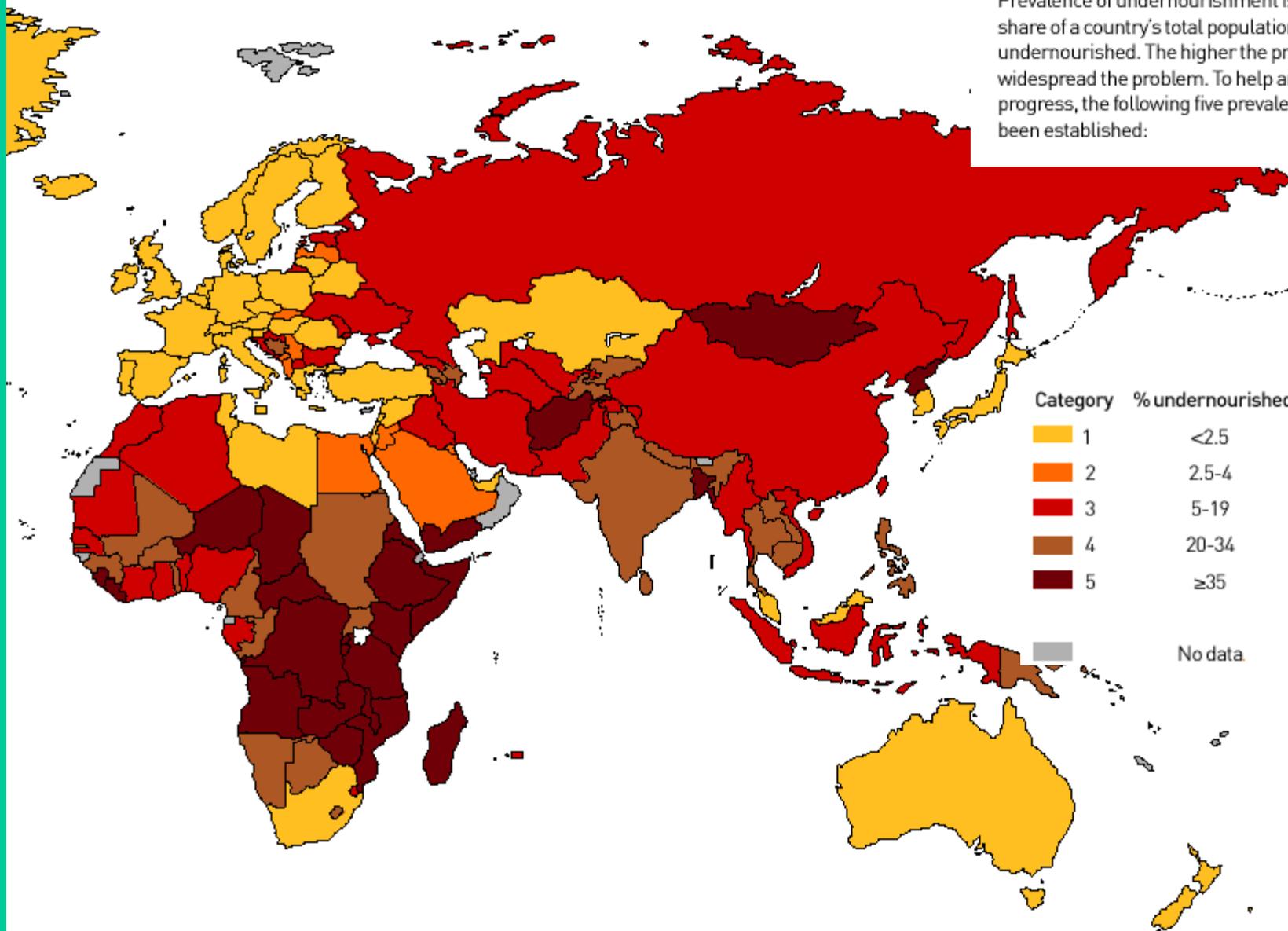
*A Celebration and
a Showcase*

**The transatlantic dissent between Europe and
the United States about GMO's**

Measuring and monitoring prevalence

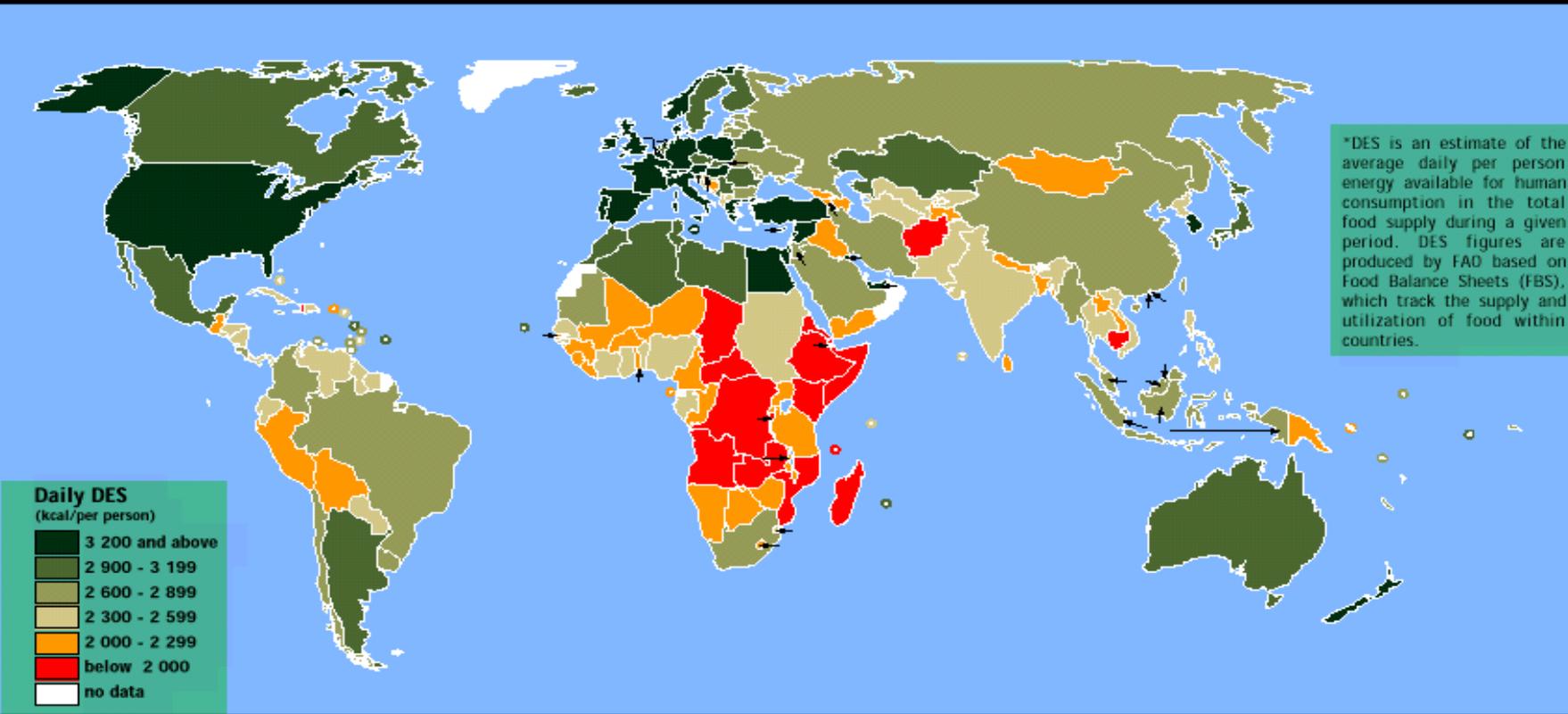
Prevalence of undernourishment is measured by the share of a country's total population that is undernourished. The higher the prevalence, the more widespread the problem. To help analyse and monitor progress, the following five prevalence categories have been established:

Category	% undernourished	Description
1	<2.5	Extremely low
2	2.5-4	Very low
3	5-19	Moderately low
4	20-34	Moderately high
5	≥35	Very high
	No data	



FAO - World Map on Food Availability

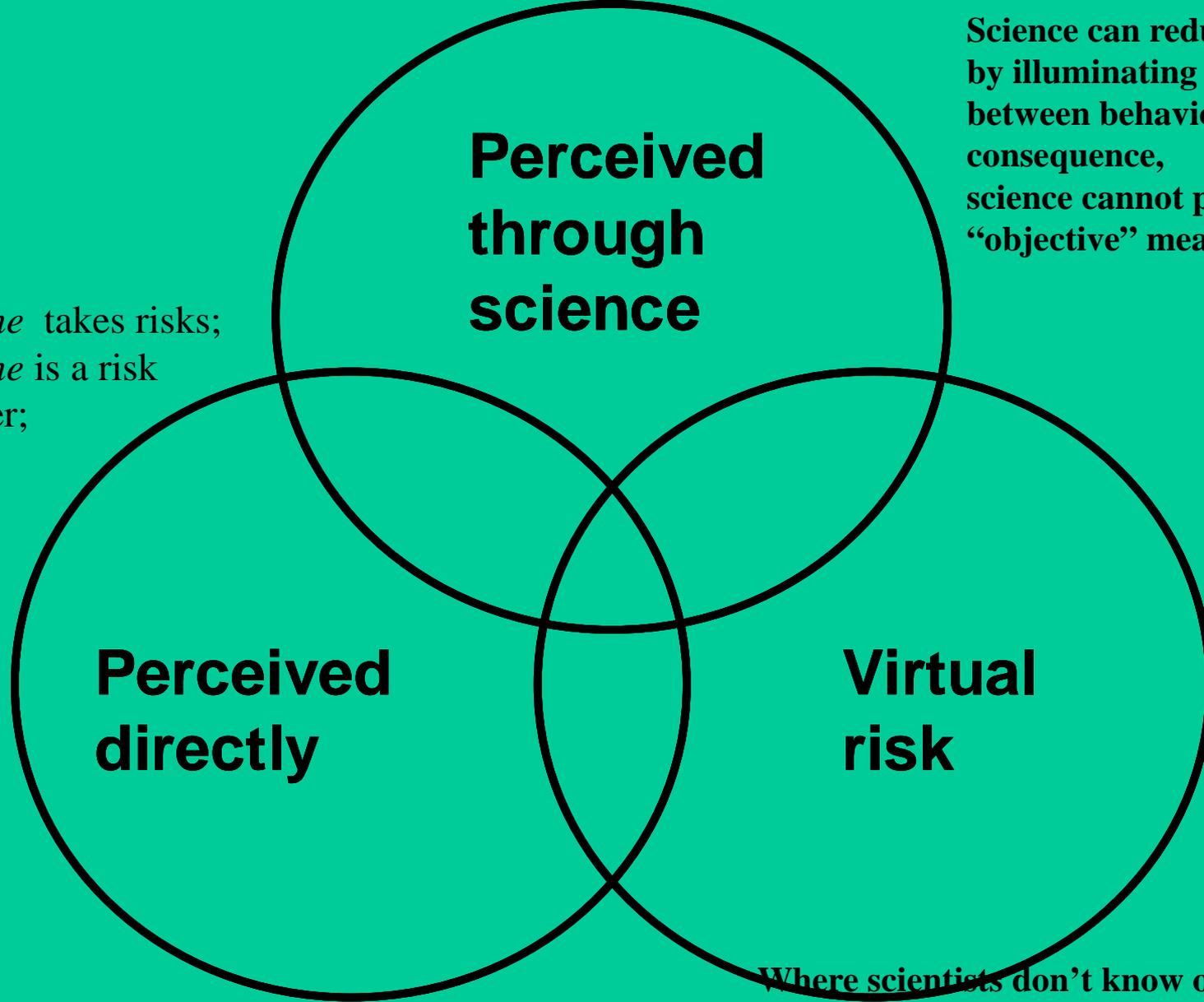
MAPPING NUTRITION AND MALNUTRITION Dietary Energy Supply (1994 -1996)



While DES does not indicate food consumption, it does identify: those countries in which people are more likely to have enough to eat (represented by shades of green); those in which the daily DES is marginal (beige); those in which hunger and

malnutrition are likely to be widespread (orange). Those countries that face the most severe food supply shortages, with average daily DES below 2 000 kilocalories per person per day, are coloured in red.





Science can reduce uncertainty by illuminating the connection between behaviour and consequence, science cannot provide “objective” measures of risk;

Perceived through science

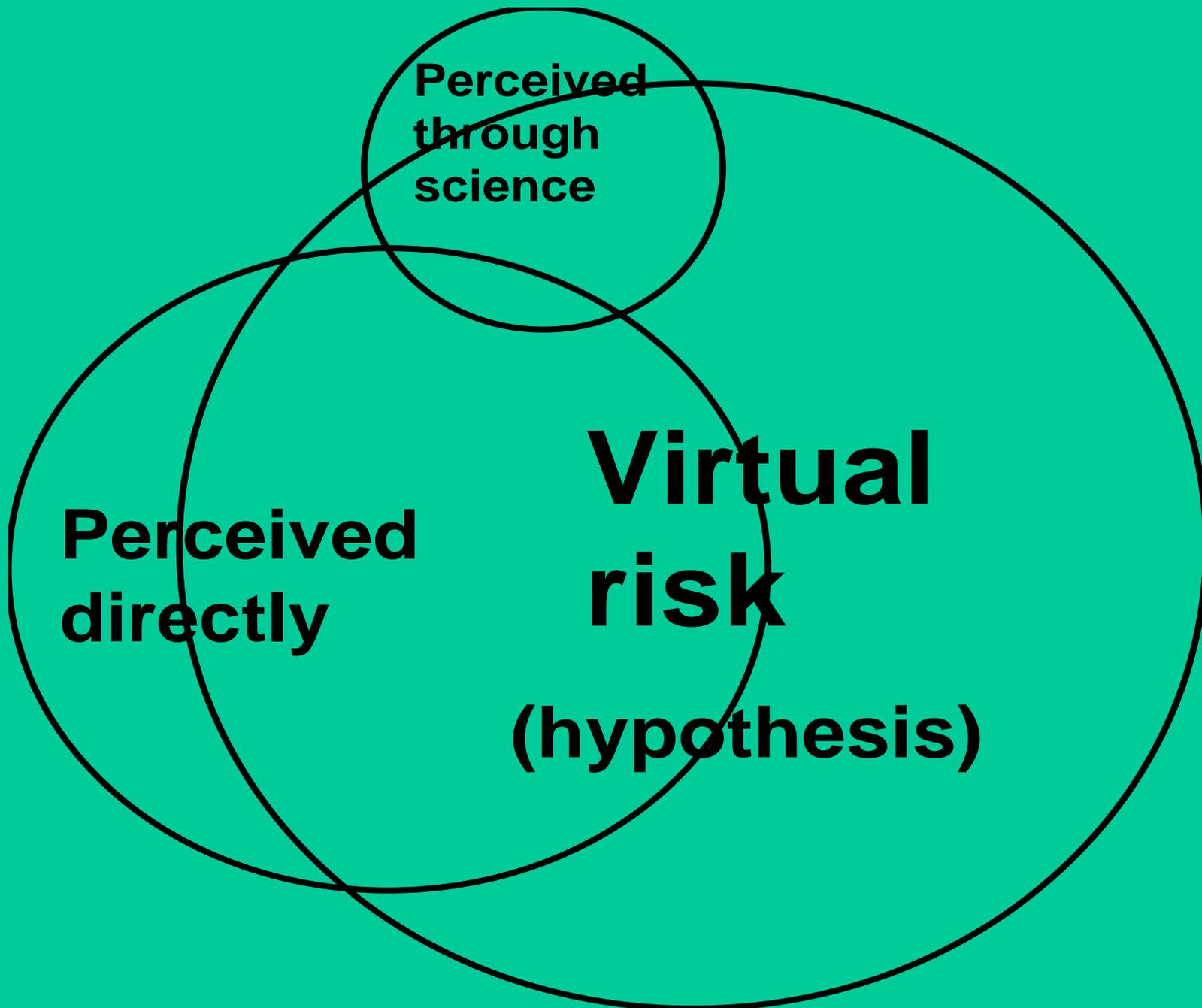
everyone takes risks;
everyone is a risk manager;

Perceived directly

Virtual risk

Where scientists don't know or cannot agree virtual risks are cultural constructs; they may or may not be real – Science cannot settle the issue – they have real consequences;

Three types of risk. **John Adams**
TRANSGENIC PLANTS AND THE
MANAGEMENT OF VIRTUAL RISKS



Karl Popper:

the most important feature
of scientific knowledge is its
revisability

Transgenic DNA introgressed into traditional maize landraces in Oaxaca, Mexico

David Quist & Ignacio H. Chapela | NATURE | VOL 414 | 29 NOVEMBER 2001

Our results demonstrate that there is a **high level of gene flow** from industrially produced maize towards populations of progenitor landraces. As our samples originated from remote areas, it is to be expected that more accessible regions will be exposed to higher rates of introgression. **Long-term studies should establish whether, or for how long, the integrity of the transgenic construct is retained, and whether the relatively low abundance of transgene introgression detected in the 2000 harvest cycle in Oaxaca will increase, decrease, or remain stable over time.**

Editorial note

In our 29 November issue, we published the paper “Transgenic DNA introgressed into traditional maize landraces in Oaxaca, Mexico” by David Quist and Ignacio Chapela. Subsequently, we received several criticisms of the paper, to which we obtained responses from the authors and consulted referees over the exchanges. In the meantime, the authors agreed to obtain further data, on a timetable agreed with us, that might prove beyond reasonable doubt that transgenes have indeed become integrated into the maize genome. The authors have now obtained some additional data, but there is disagreement between them and a referee as to whether these results significantly bolster their argument.

In light of these discussions and the diverse advice received, *Nature* has concluded that the evidence available is not sufficient to justify the publication of the original paper. As the authors nevertheless wish to stand by the available evidence for their conclusions, we feel it best simply to make these circumstances clear, to publish the criticisms, the authors’ response and new data, and to allow our readers to judge the science for themselves.

Editor, *Nature*

Im Lichte dieser Diskussionen schloss Nature, dass die Autoren der ursprünglichen Publikation nicht genügend Beweise vorlegten für ihre Thesen [der Auskreuzung von Transgenen in Landrassen]

There are several
different kinds of knowledge:

- factual knowledge
- traditional knowledge of
the daily life
- deontic knowledge
(what ought to be)
- instrumental knowledge
- conceptual knowledge etc.

earlier difficulties during introduction
of novel medicine
and novel food



The Cow Pock or the Wonderful Effects of the New Inoculation!
James Gillray (1757-1815) Photographic reproduction of an etching appearing in *Vindice--The Publications of ye Anti-Vaccine Society*, June 12, 1802, National Library of Medicine

Women's Petition Against Coffee 1674

We find of late a very sensible Decay of the true Old English Vigour
Never did Men wear greater Breeches, or carry less in them of any
Mettle whatsoever.

The Excessive use of the Newfangled, Abominable, Heathenish Liquor
called Coffee,
which... has so Eunucht our Husbands, and Crippled our more kind
Gallants...

They come from it with nothing Moist but their snotty Noses, nothing
stiffe but their Joints, nor standing but their Ears...

Dec. 29, 1675, King Charles II

Proclamation for the Suppression of Coffee Houses
aimed at banning

‘the great resort of Idle and disaffected persons’
by January 10, 1676

Two days before that date the proclamation was
withdrawn
because of public outcry

Marc Pendergrast: *Uncommon Grounds: The History of Coffee and How it
Transformed
the World*, 525 p, 1999, ISBN 0465036317, Basic Books

New Experts in the EU

TALKING POINT: The Prince's Online Forum



The Prince of Wales wants to hear your views.

Join The Prince's Online Forum

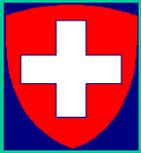
In his first Online Forum, The Prince of Wales calls for a public debate on whether we need genetically modified crops. ▶

THE GREENS DEMAND A BAN ON
THE RELEASE OF GE ORGANISMS
BECAUSE THERE IS NO PROOF THEY ARE
SAFE...

AND WE WANT TO LEGALIZE
CANNABIS, EVEN THOUGH THERE
IS PROOF IT IMPAIRS MEMORY
AND LEARNING, AND PREMATURELY
AGES THE BRAIN...



Tom
Slott



The Swiss Referendum on Gene Technology



- General ban for transgenic animals
- General ban for the release of GMO's
- no patenting of GMO's including products and processes thereof

June 7th, 1998

66.7 % NO / 33.3 % YES

41.05 % of population voted

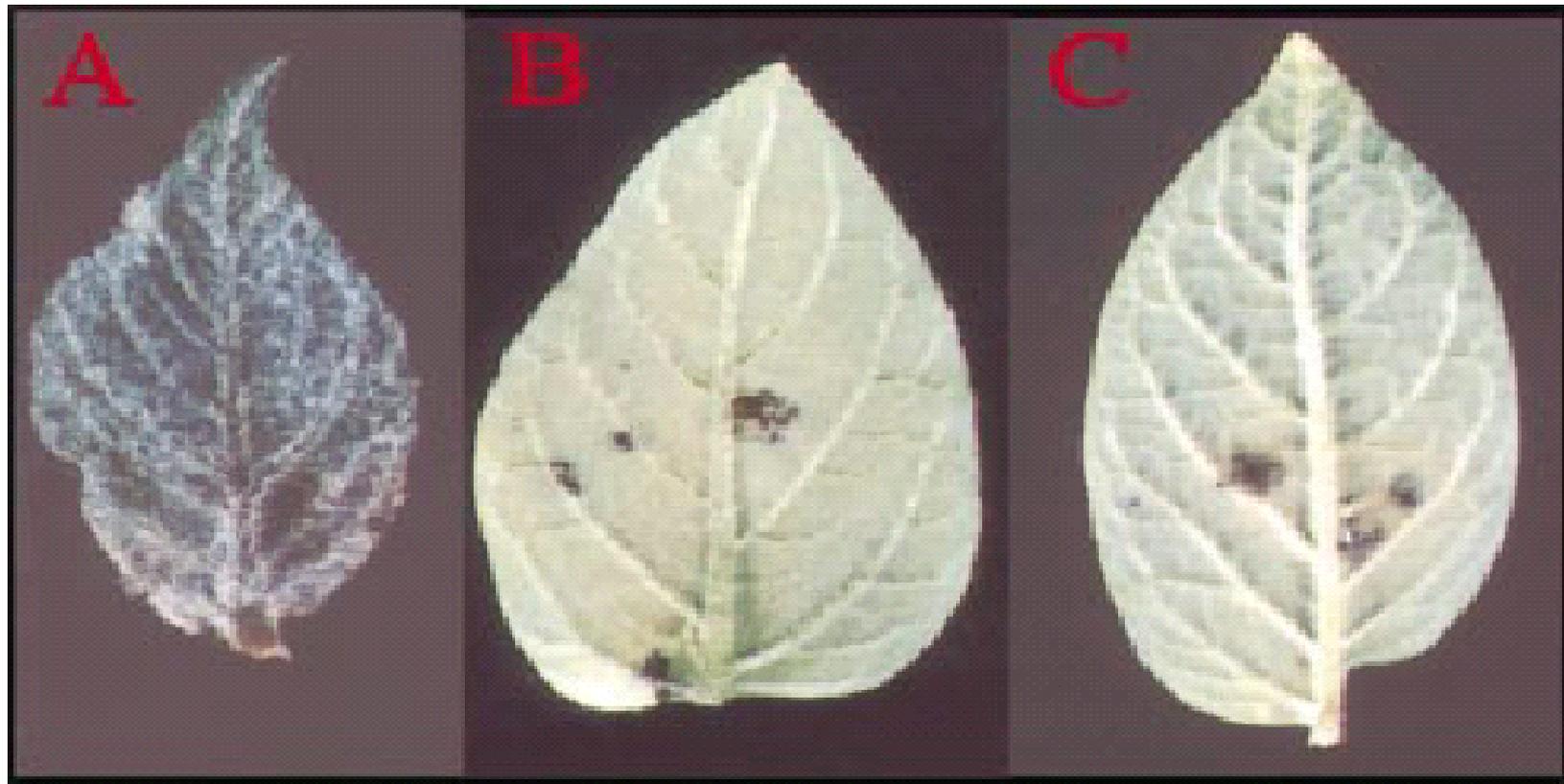


Figure 2. *R1* complementation test.

Disease symptoms are shown 9 days post-inoculation on leaflets from susceptible cultivar Desirée (A), transgenic Desirée line no. 10-5-5 transformed with clone y10 (B), and the resistant parent P41 (*R1r1*) (C).

The Plant Journal (2002) 30(3), 361±371

Agim Ballvora¹, Maria Raffaella Ercolano¹, Julia Wei^{°1}, Khalid Meksem², Chr
Petra Oberhagemann¹, Francesco Salamini¹ and Christiane Gebhardt^{1,*}

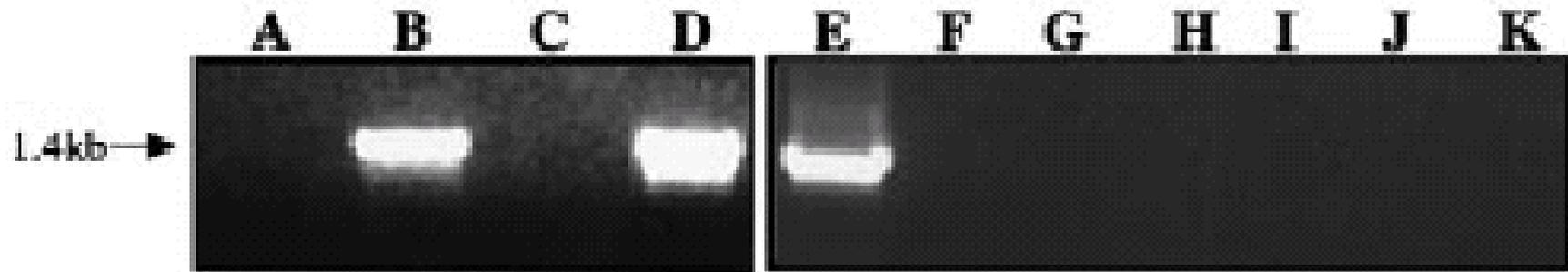


Figure 3. *R1*-specific PCR.

PCR amplification of a 1.4 kb fragment of the *R1* gene using allele-specific primers 76-2sf2 and 76-2SR and template DNA of (A) Desirée; (B) resistant parent P41; (C) susceptible parent P40; (D) transgenic Desirée plant 10-5-5; (E) BAC clone BA87d17 carrying the *R1* allele; (F–J) BAC clones BA122p13, BA12101, BA76011, BA47F2 and BA27c1, respectively; (K) negative control.

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FIGURE 6 PROPORTION OF EU POPULATION WILLING TO BUY GMO – DERIVED FOODS (%)

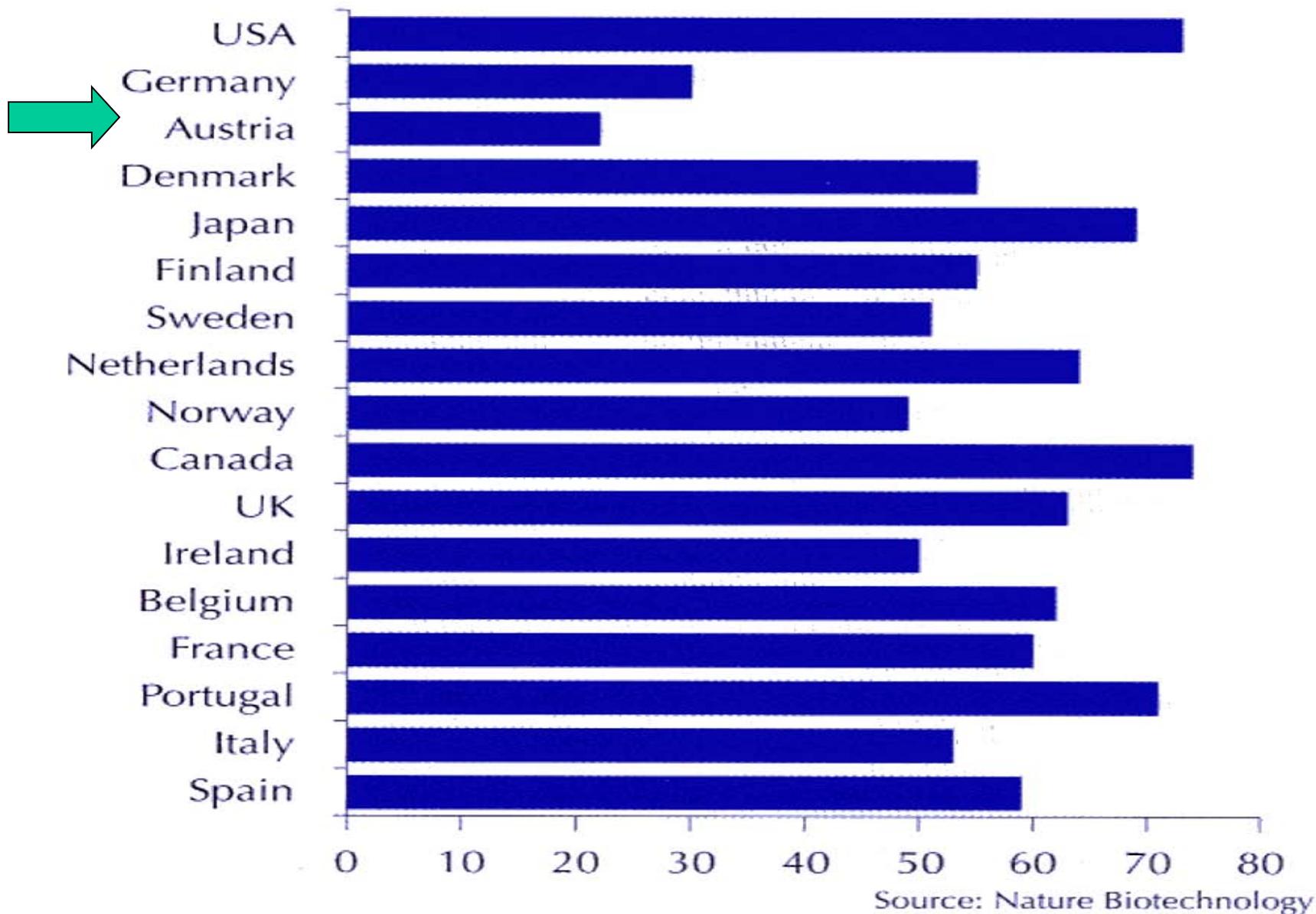


FIGURE 7 PROPORTION OF EU POPULATION VERY CONCERNED ABOUT FOOD RISK (%)

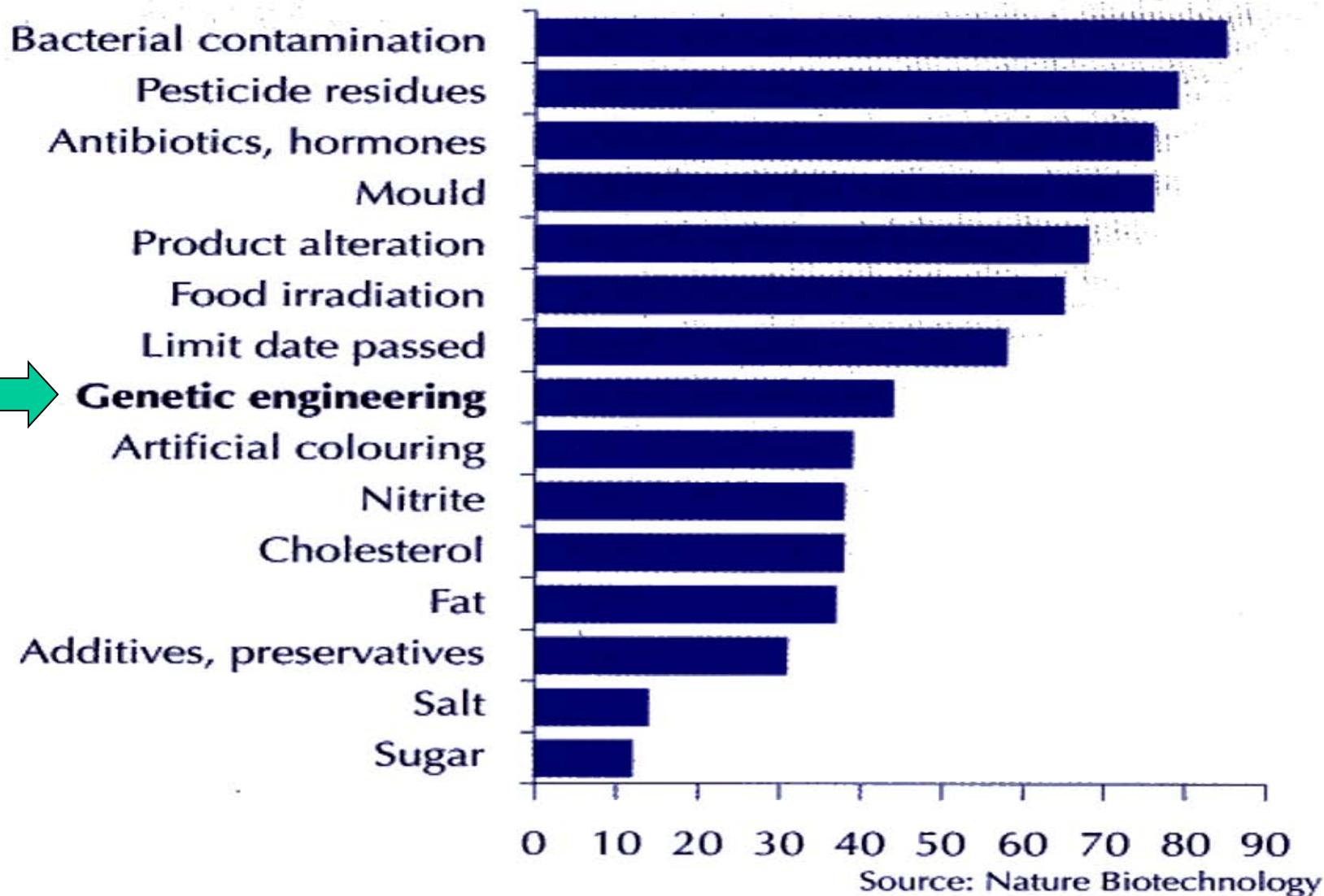
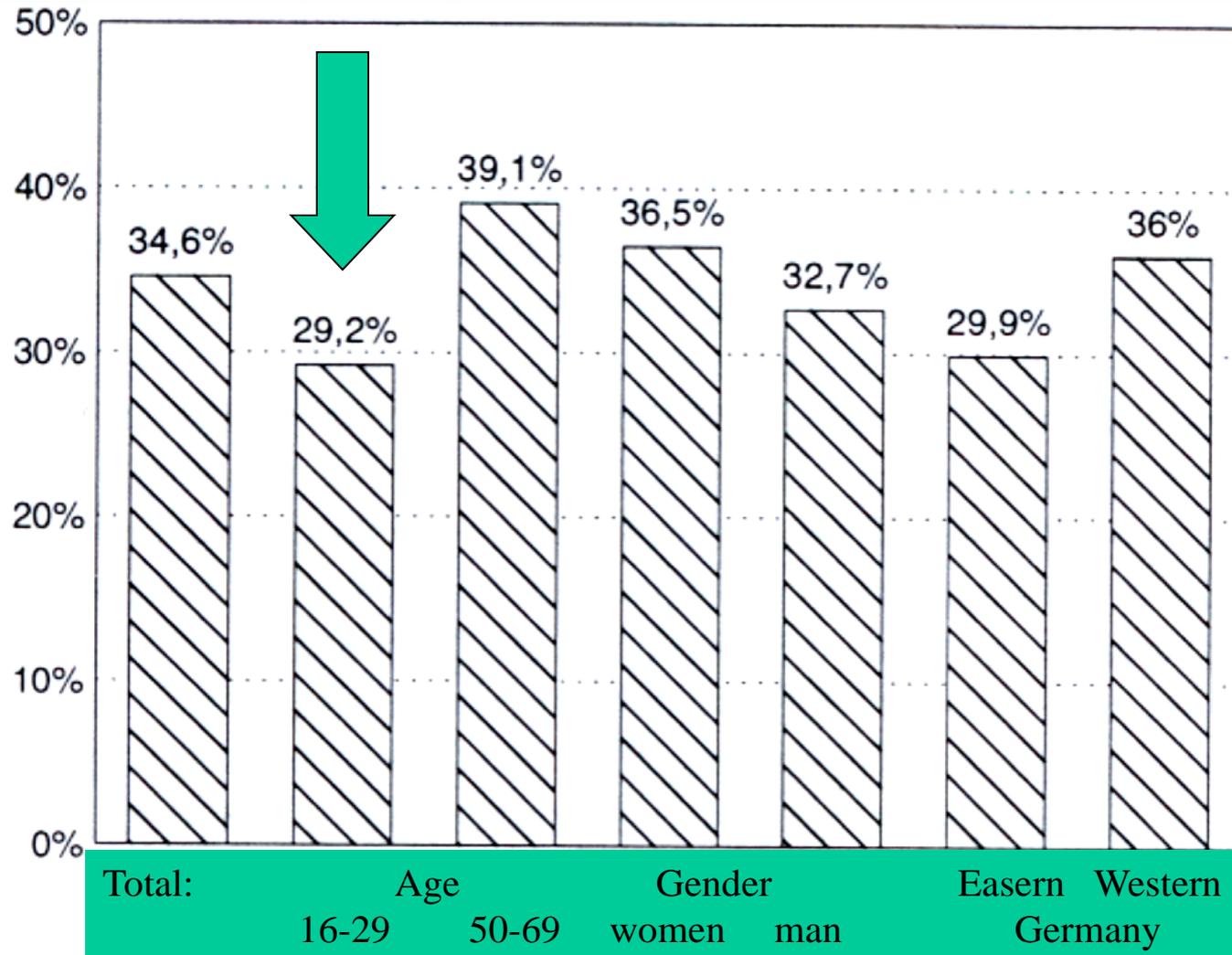
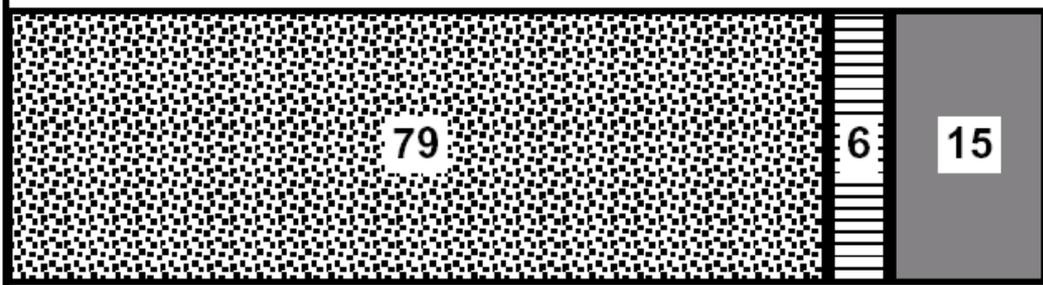


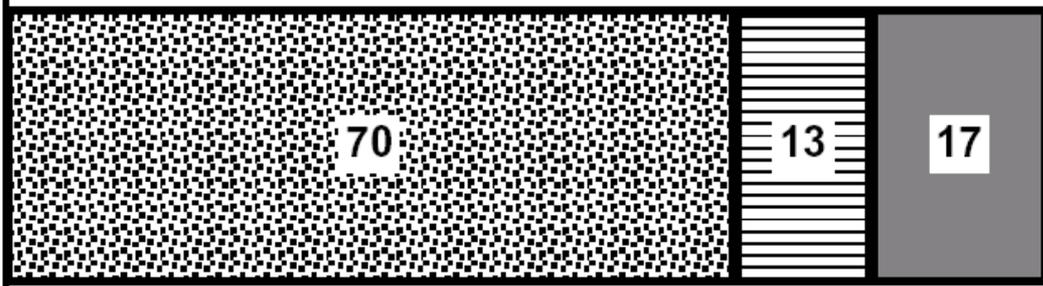
Abb. 2.1. fundamental Opposition of consumers in Germany against GM, split into population segments



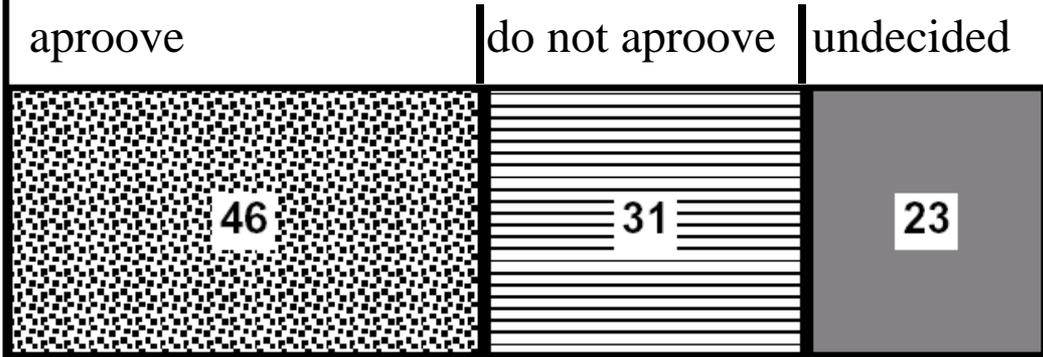
Quelle: GfK, 1995



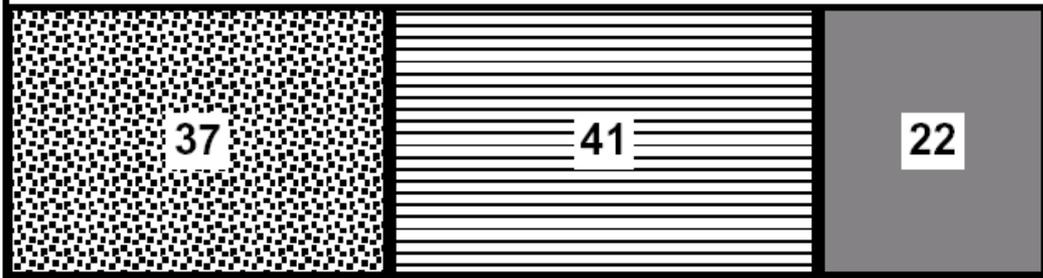
GM in human medicine



screening for genes in humans



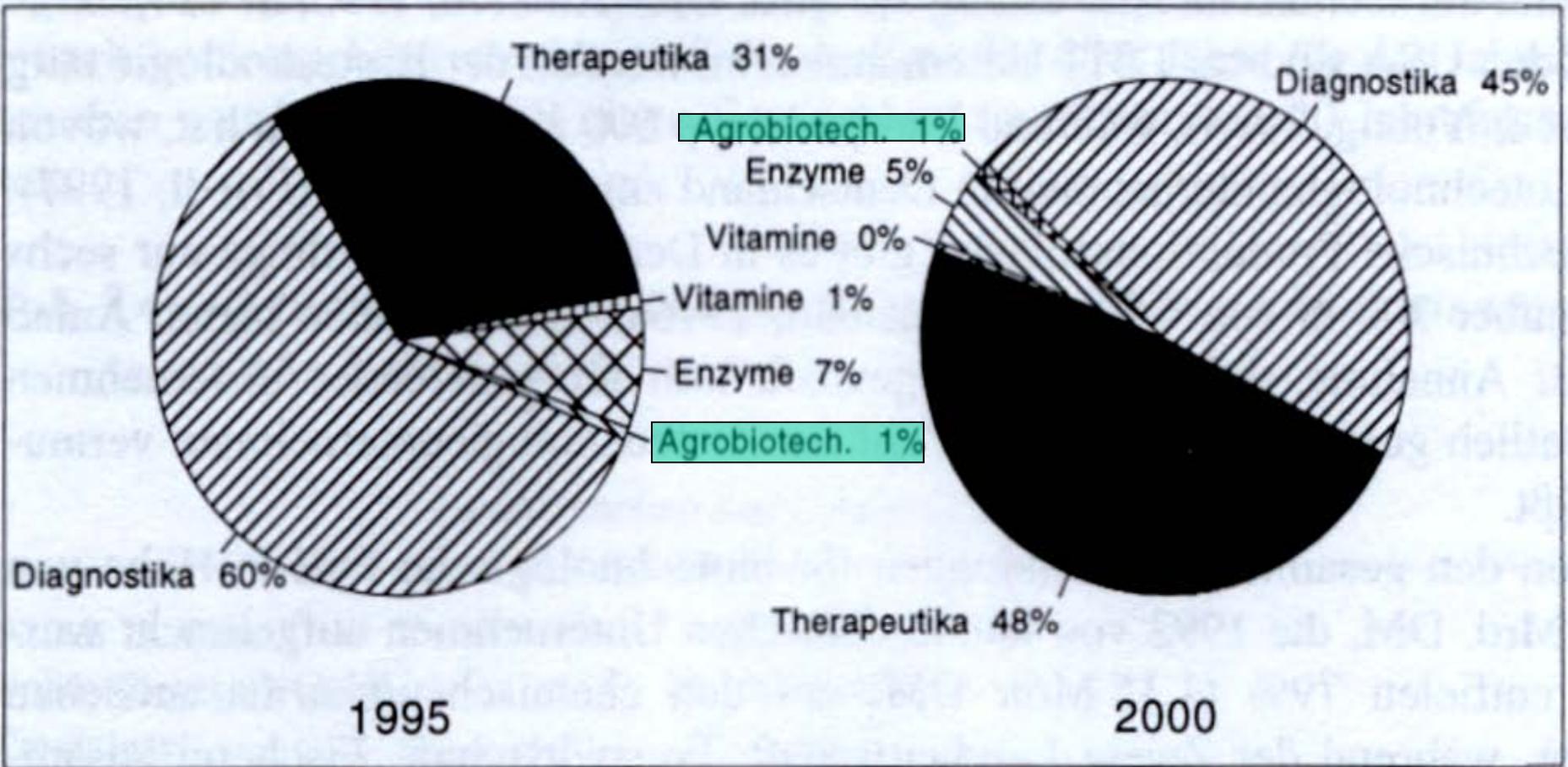
use biopesticide genes in crops

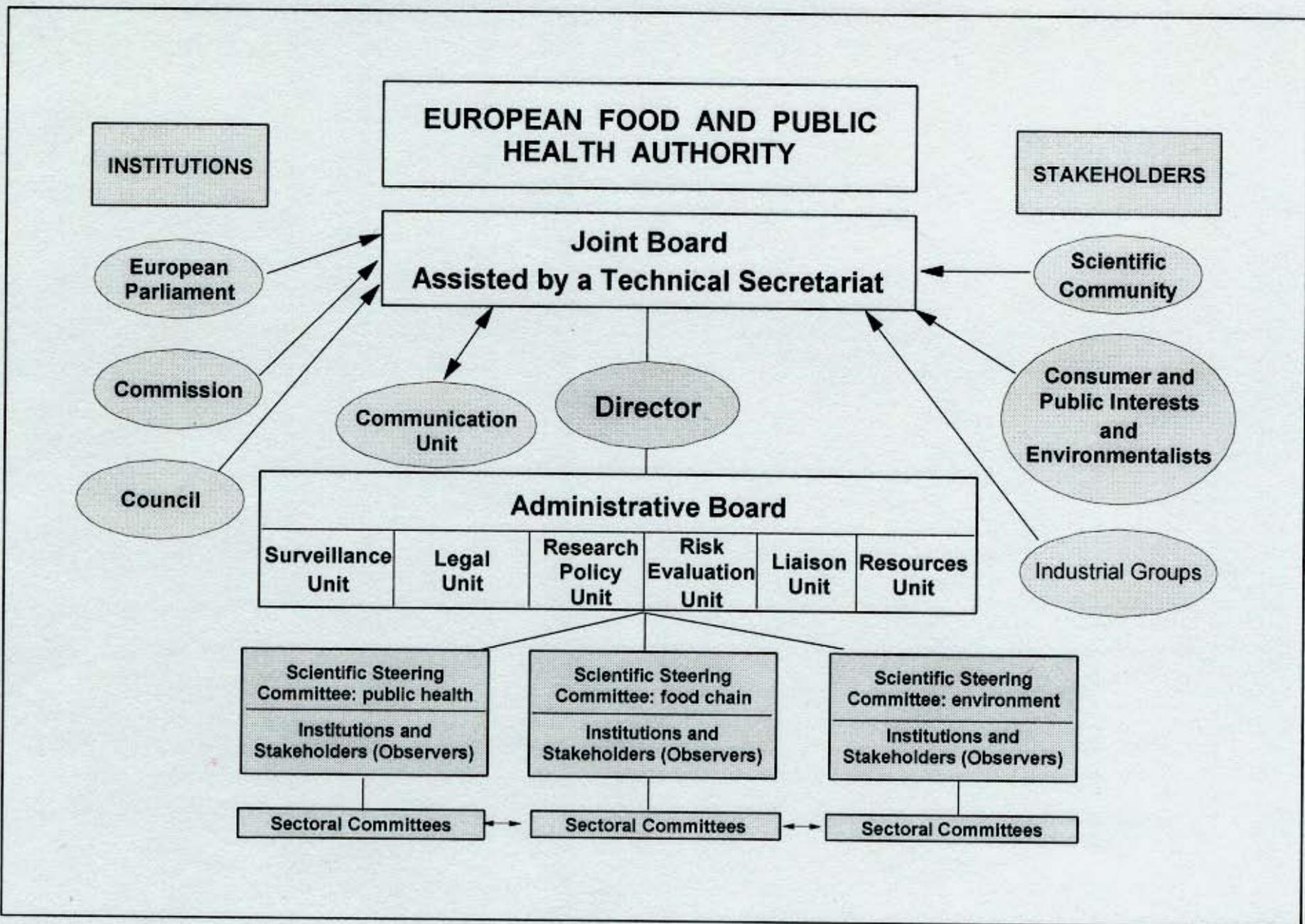


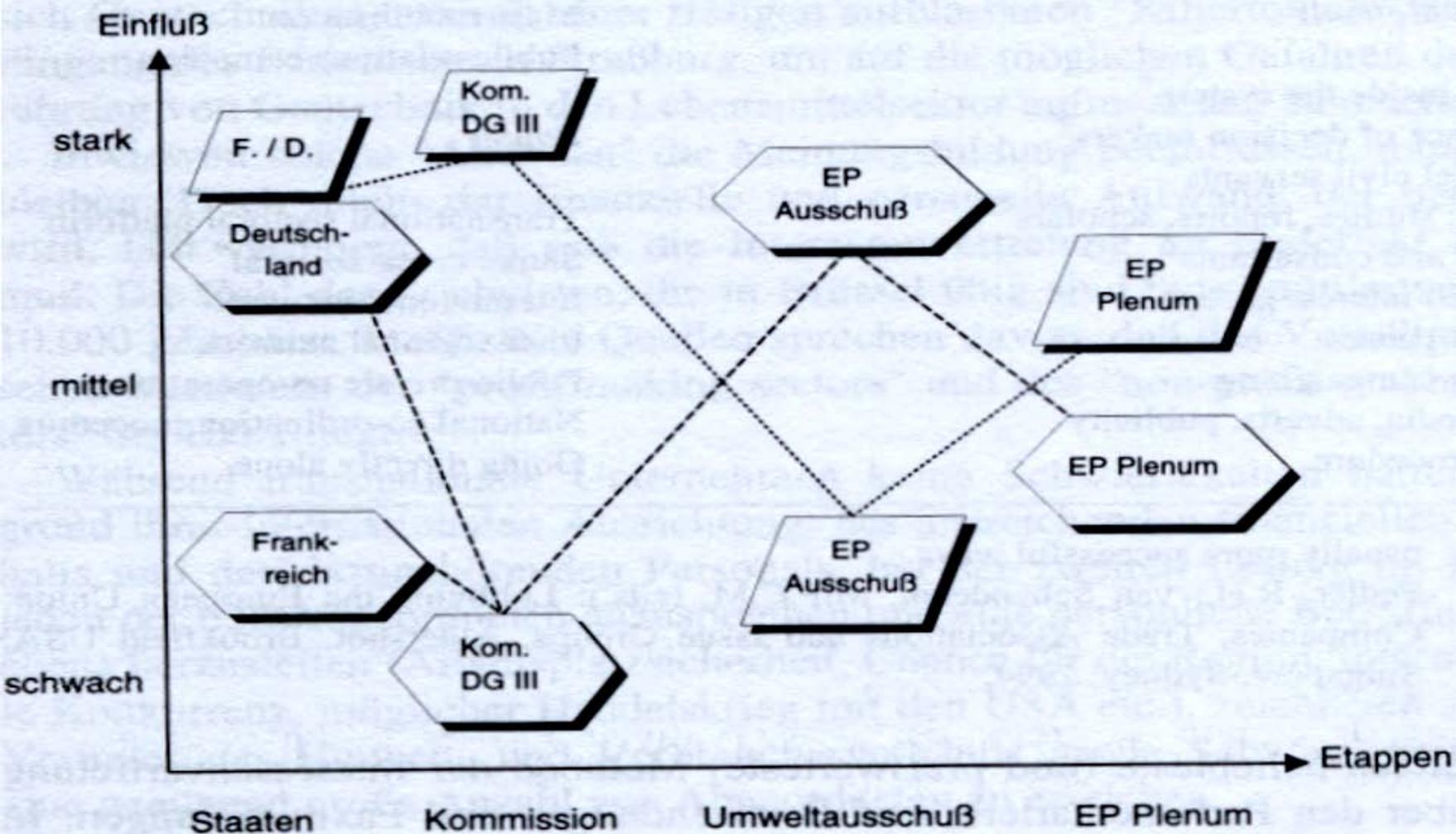
use GM to enhance yield

Allensbach Poll October 26, 2001

Abb 2.4: Market share of Biotech Products, relatet to cash flow

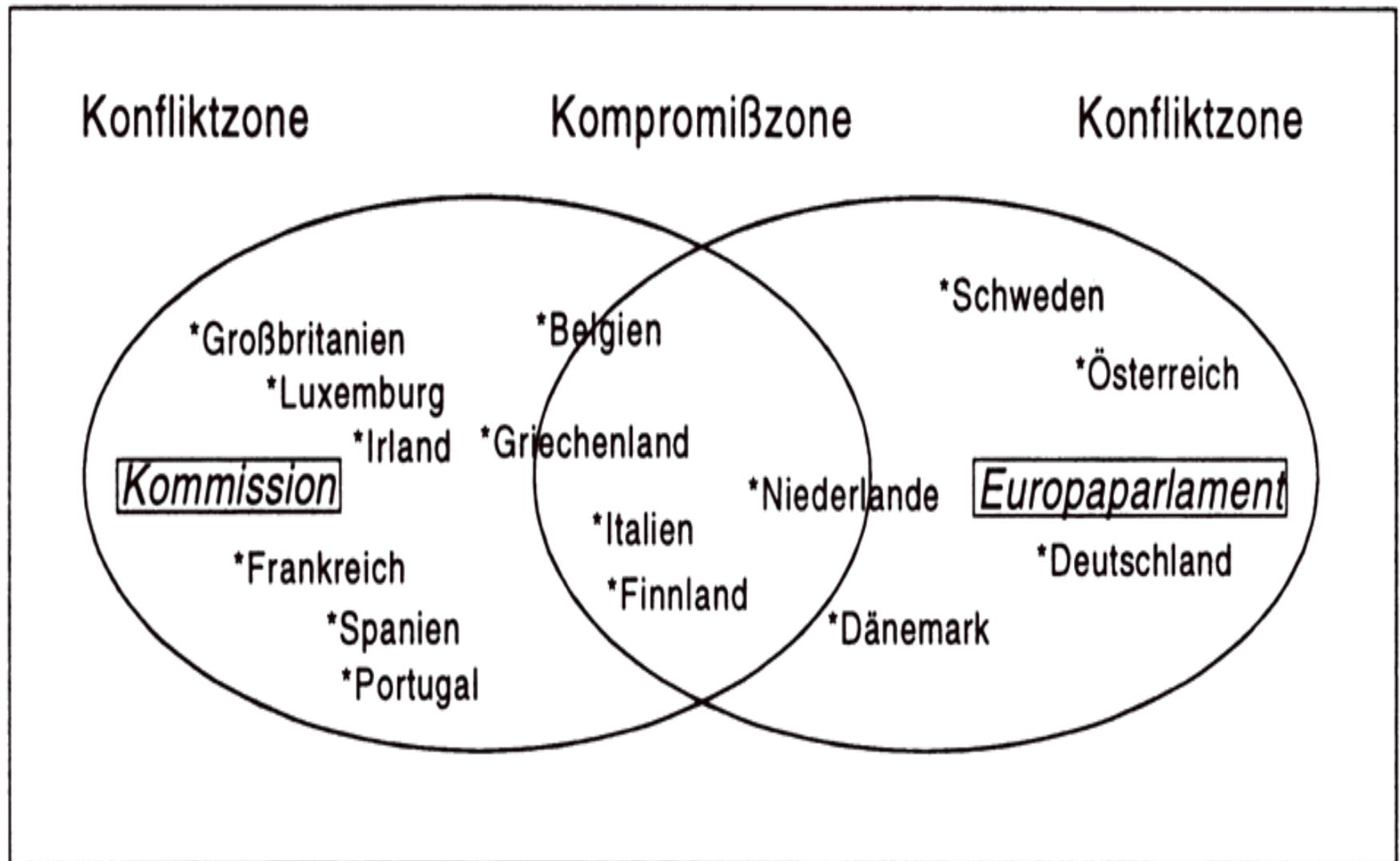






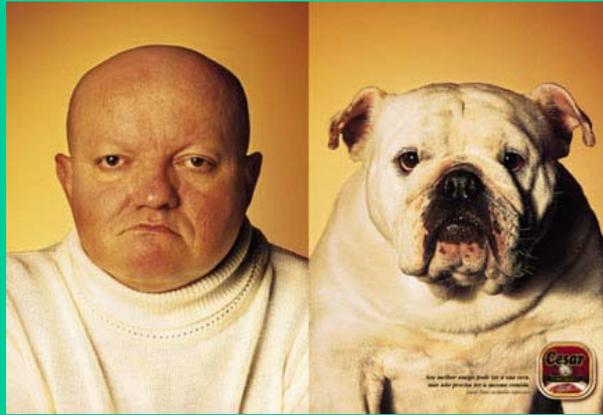
Einfluß der NGO's Einfluß der Industrie F. = Frankreich, D. = Deutschland

Abb. 4.2: Positionen im Vermittlungsausschuß



A few thoughts about Risk Balance

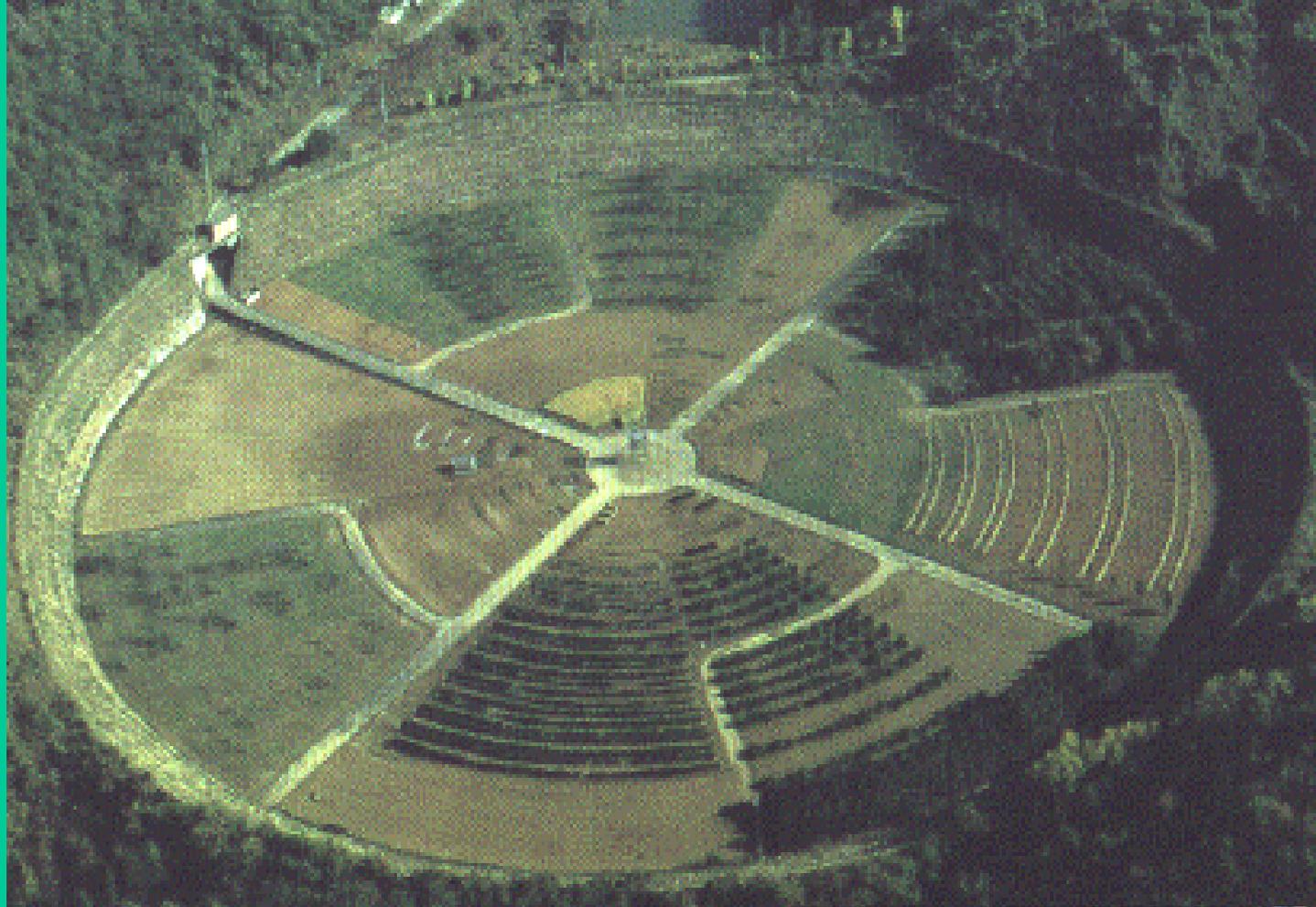
Dogs...



Gamma Field for radiation breeding

100m
radius

89 TBq
Co-60
source at
the center
Shielding
dike 8m
high



Better
spaghettis, whisky
1800 new plants



Institute of
Radiation Breeding
Ibaraki-ken, JAPAN
<http://www.irb.affrc.go.jp/>

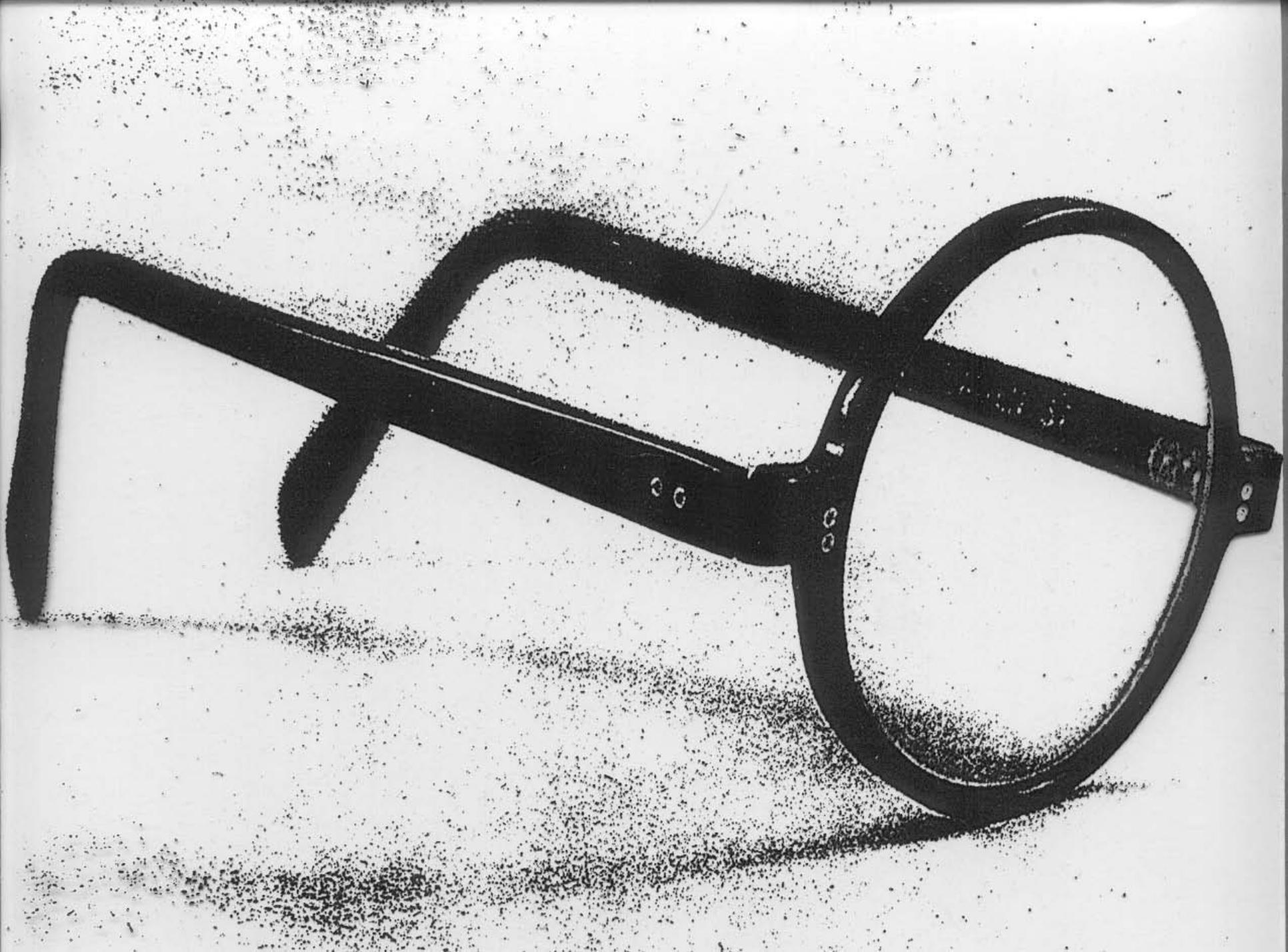


S.H. T. 15

"WHAT'LL IT BE — ONE LARGE RISK OR SEVERAL SMALL ONES ?"

1904 - 1912





2595 58

Uw cornflakes zijn zo heerlijk
knapperig omdat wij genen van
schorpioenen in de mais doen.

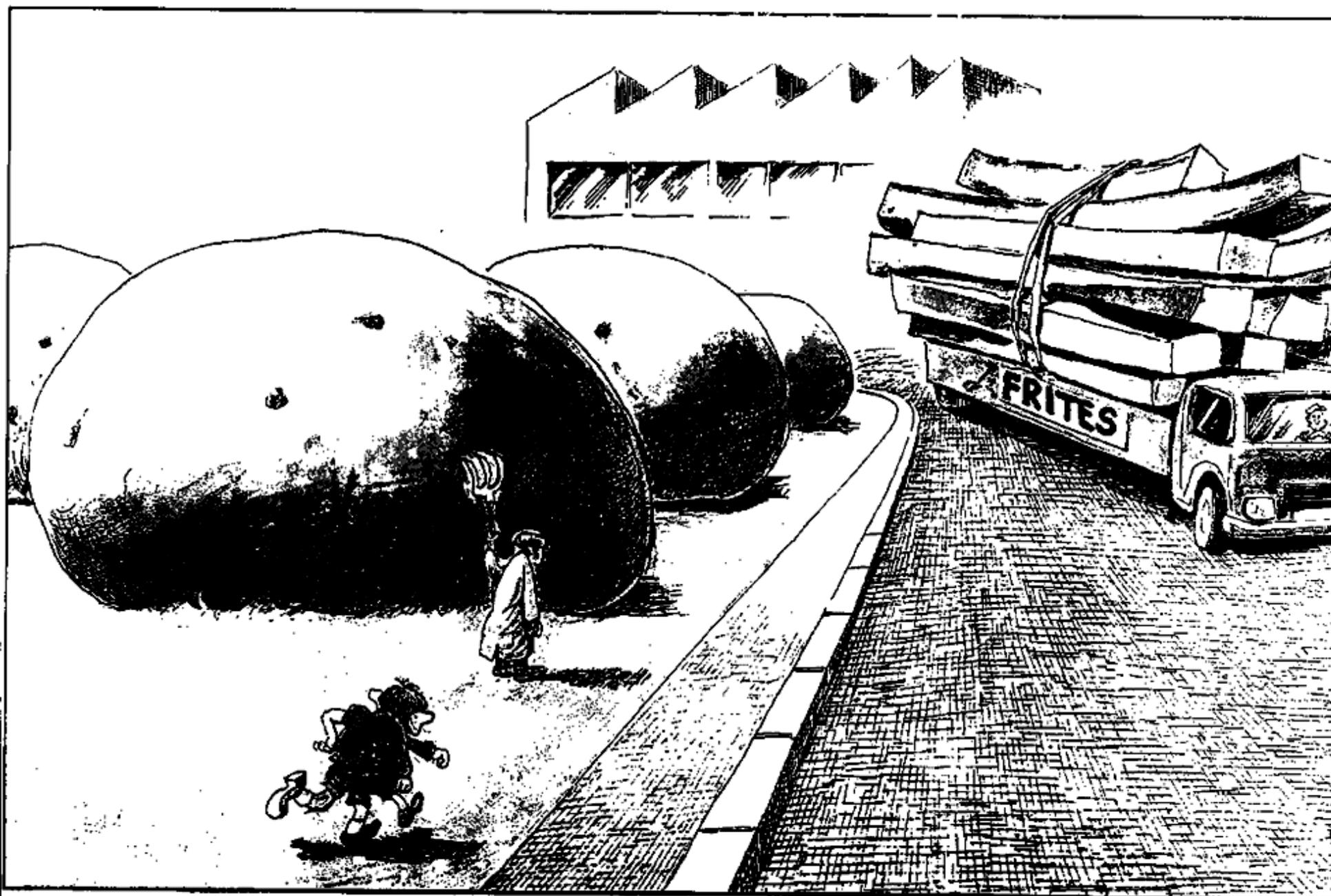


Bon Appétit!

Your cornflakes are nice and crispy because we have introduced genes from scorpions into maize

 NOVARTIS
Genetic manipulations, USA

VOOR MEER INFORMATIE OVER GGO EN HOUT VOEDSEL: WWW.GENETISCHVWAZEN.NL



Burki, '24 Heures'



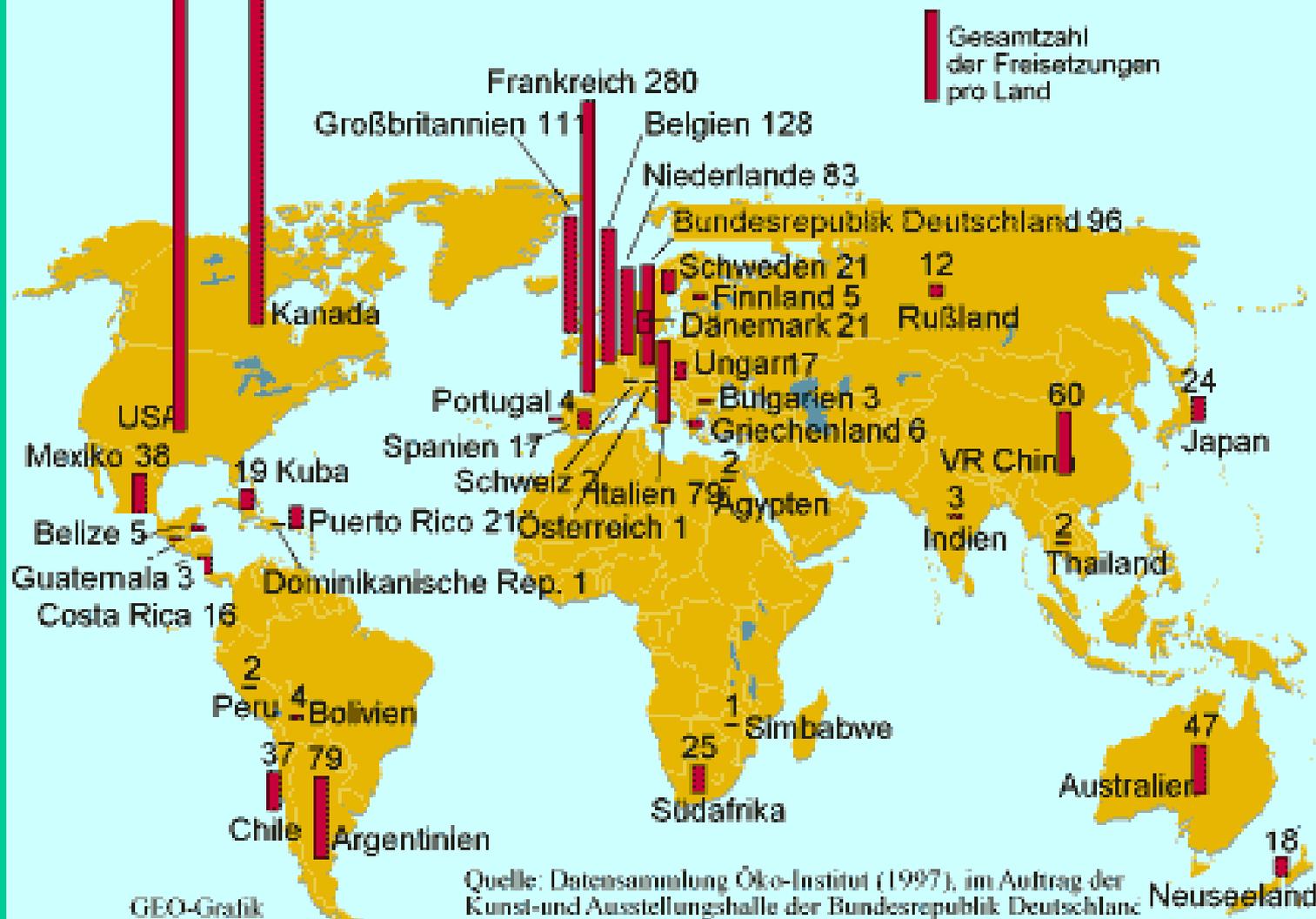
Emotive produce: protesters uproot GM plants.



Destroyed field of experimental potatoes in Germany 16/17. June 2002

1952

Freisetzungs-Experimente mit gentechnisch veränderten Pflanzen weltweit

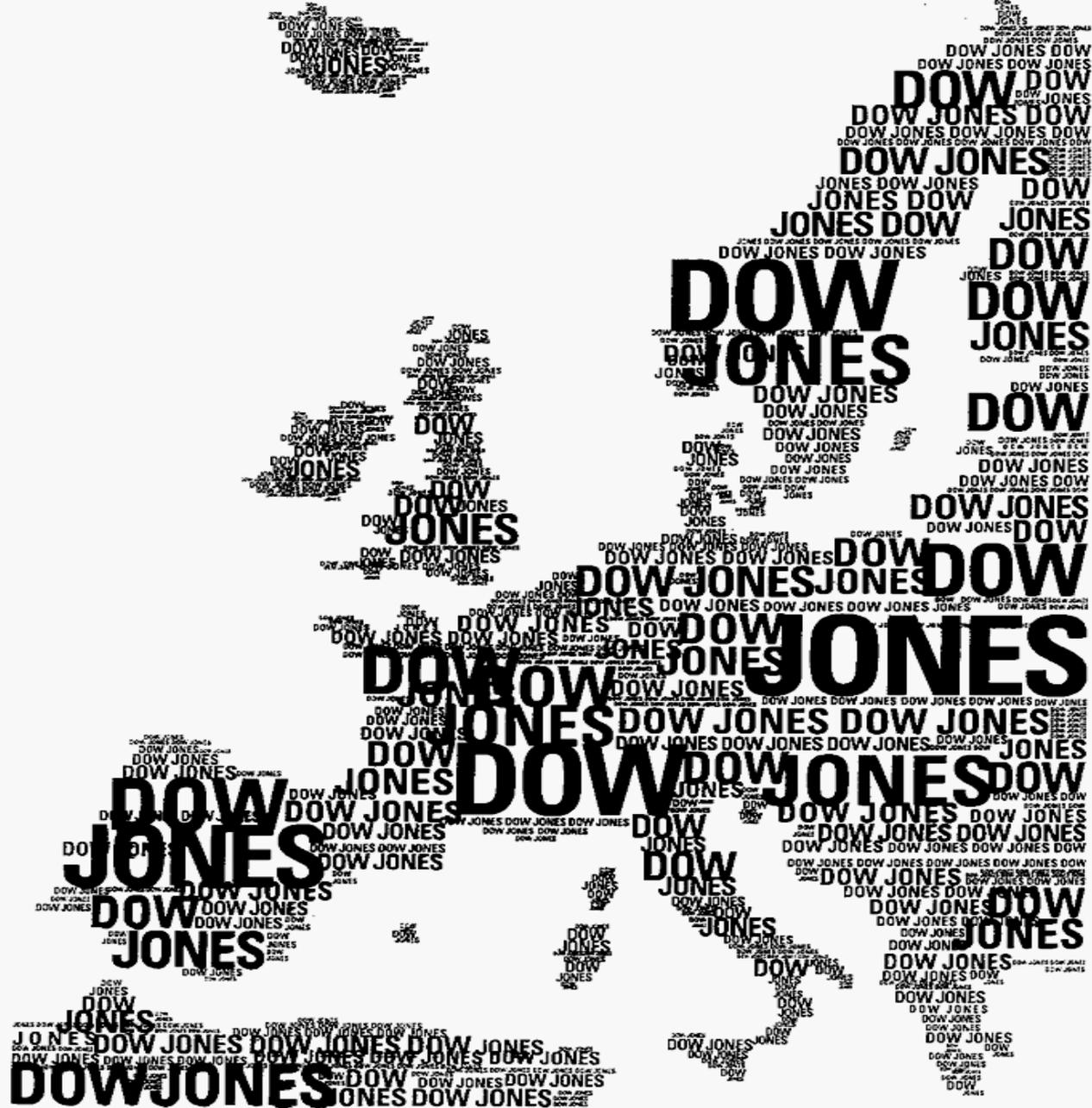


Monsanto: Food, Health and Hope

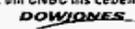
Monsanto: Fraud, Stealth and Hype



ALJI

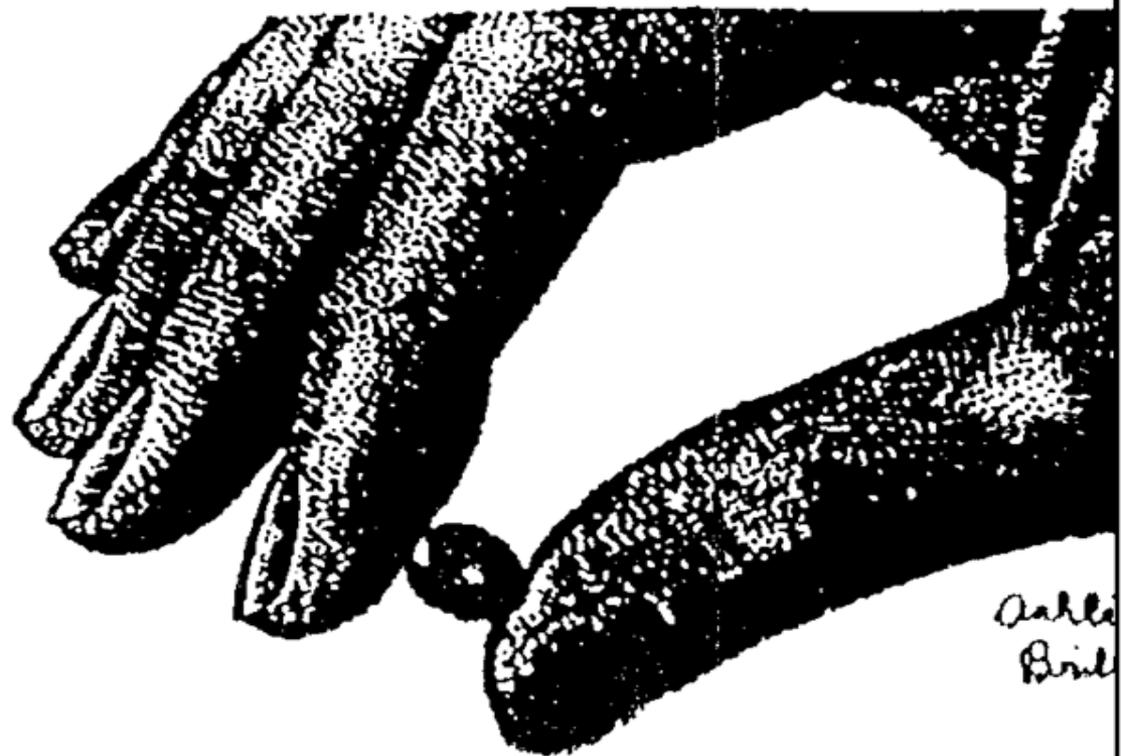


Wir haben «The Wall Street Journal Europe» an das Handelsblatt angeschlossen. Wir haben Dow Jones Newswire für mehr Menschen zugänglich gemacht. Wir haben Dow Jones Interactive mit Reuters Business Briefing verbunden. Wir haben uns mit der FT zusammengesetzt, um «Vedomosti» – eine neue russische Wirtschaftszeitung – aus der Taufe zu heben. Wir haben die Dow-Jones-STOXX-Markindizes in die französische, die Deutsche und die Schweizer Börse integriert. Und wir haben uns mit NBC verbündet, um CNBC ins Leben zu rufen. Gleichgültig, welche wirtschaftlichen und finanziellen Informationen Sie benötigen – Sie werden feststellen: Wir haben Europa im Griff.



The precautionary principle

ALWAYS
TAKE
YOUR
VITAMINS



IN ALPHABETICAL ORDER

IT HASN'T YET
BEEN PROVEN NECESSARY,
BUT WHY TAKE CHANCES?

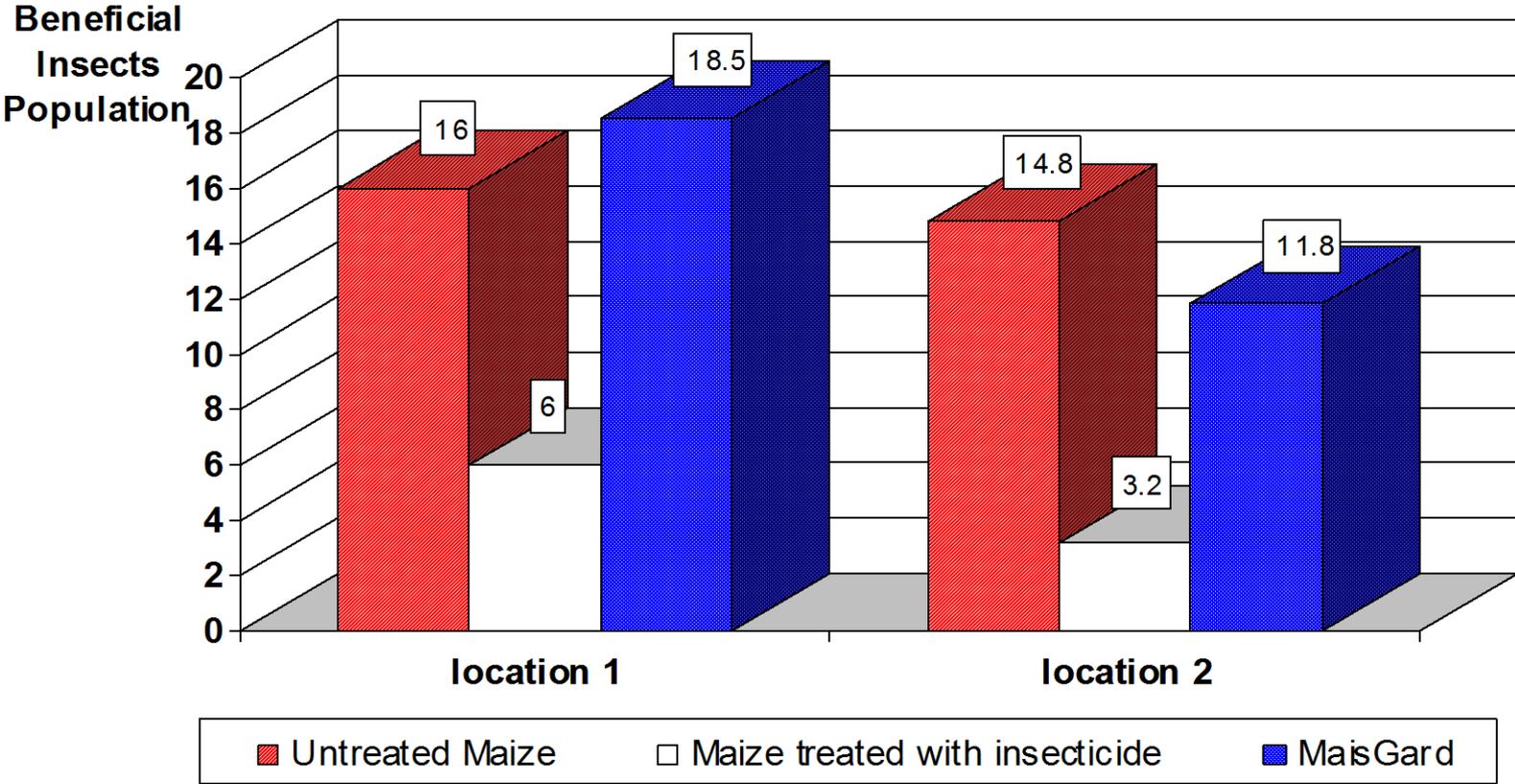
xy believes that appropriate post-commercialisation monitoring of genetically modified crops should be instituted on a case-by-case basis,

grounded on the results of a scientific risk assessment, and acknowledging the uncertainties that exist among the Public and regulatory agencies with regards to the environmental safety of modified crops

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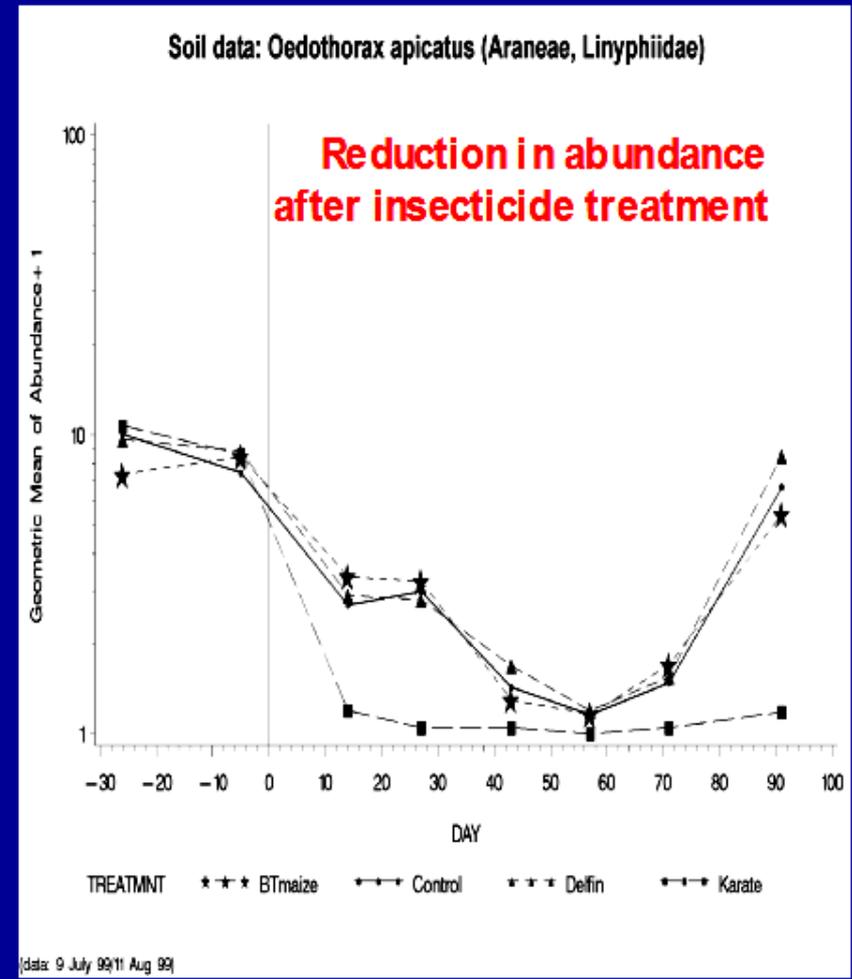
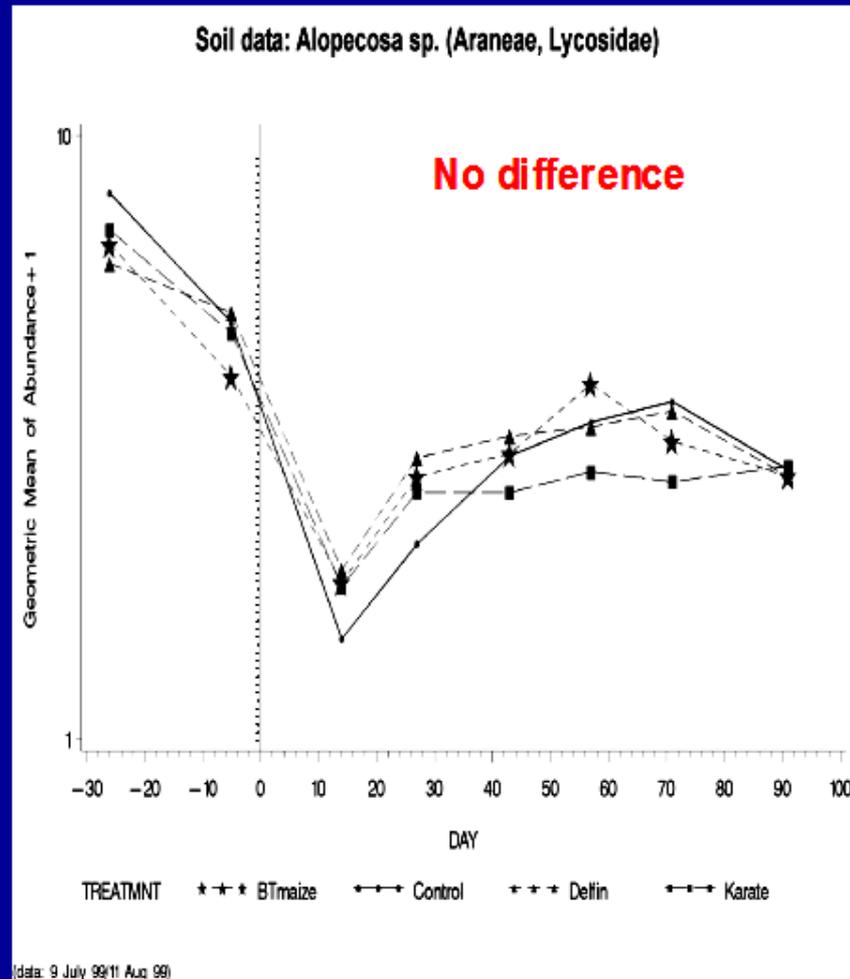
Beneficial arthropods: average /30 plants (August 1995)

Monsanto Company confidential



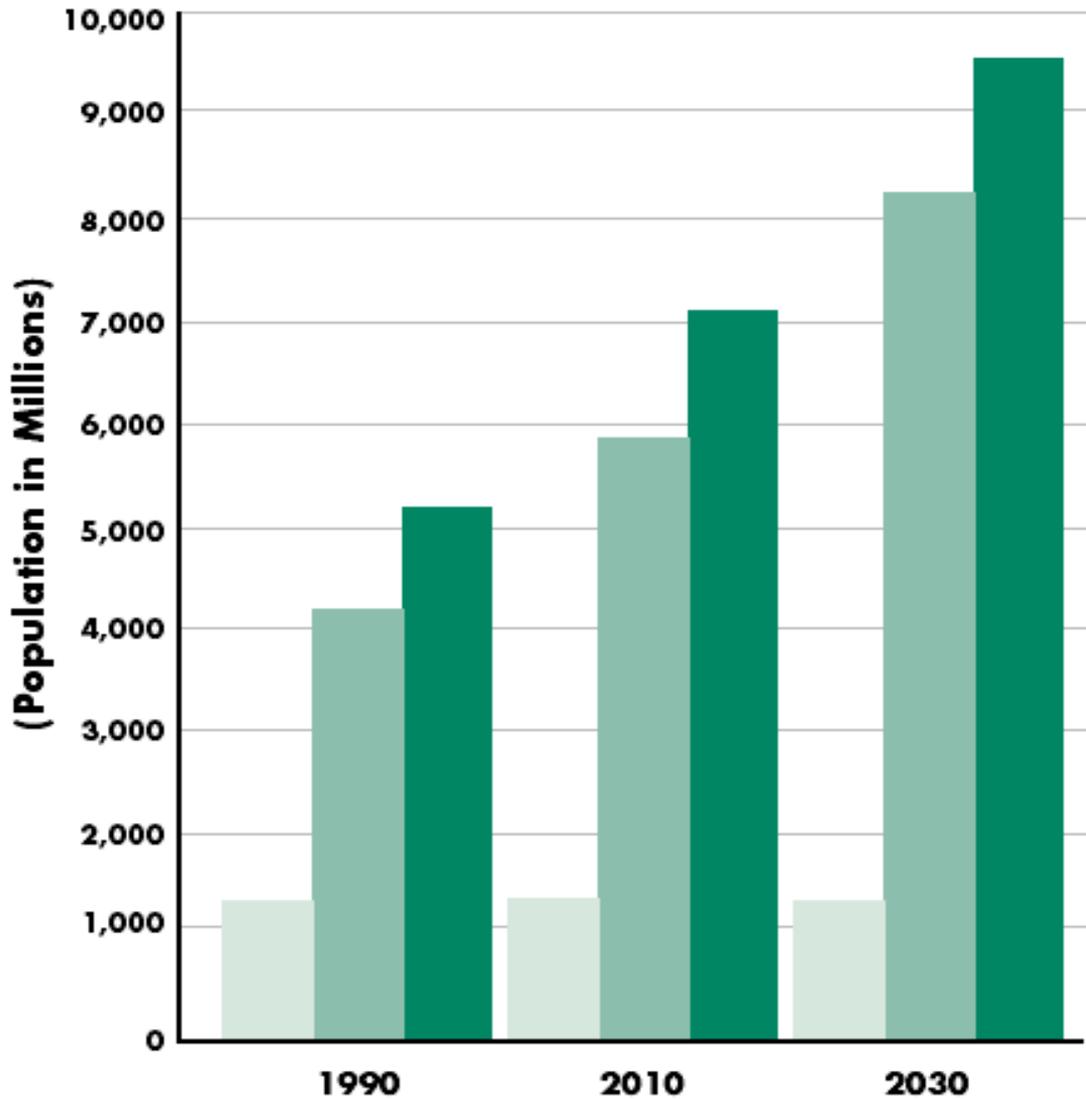
Beneficial insects belong to Anthocoridae, Nabidae, Coccinellidae, Staphylinidae, lacewings and spiders

Soil fauna: *Alopecosa* sp. and *Oedothorax apicatus*



順路
THIS WAY





Industrialized Regions
 Developing Regions
 World Total

COMMON GROUND, COMMON FUTURE

HOW ECOAGRICULTURE CAN HELP FEED THE WORLD AND SAVE WILD BIODIVERSITY

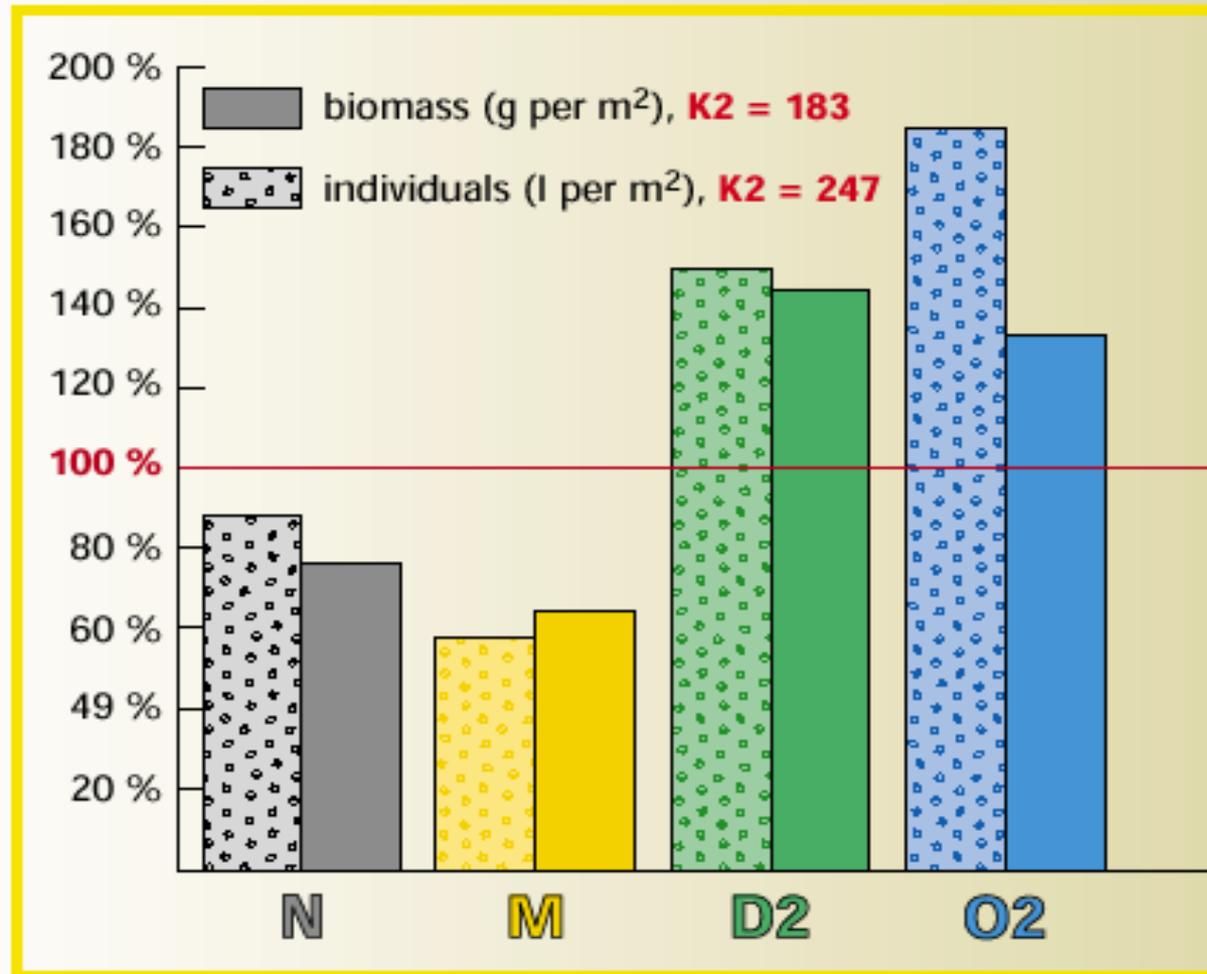
By Jeffrey A. McNeely and Sara J. Scherr

MAY 2001

The world's population will grow fastest in the developing world, home to many of the world's richest areas of biodiversity. (Lutz, W., C. Prinz, and J. Langgassmer. 1993. World population projections and possible ecological feedbacks. POPNET 12: 1-11; United Nations, 1994 estimate.)



Biomass and density of earthworms (average of 1990, 1991 and 1992), K2 = 100 %



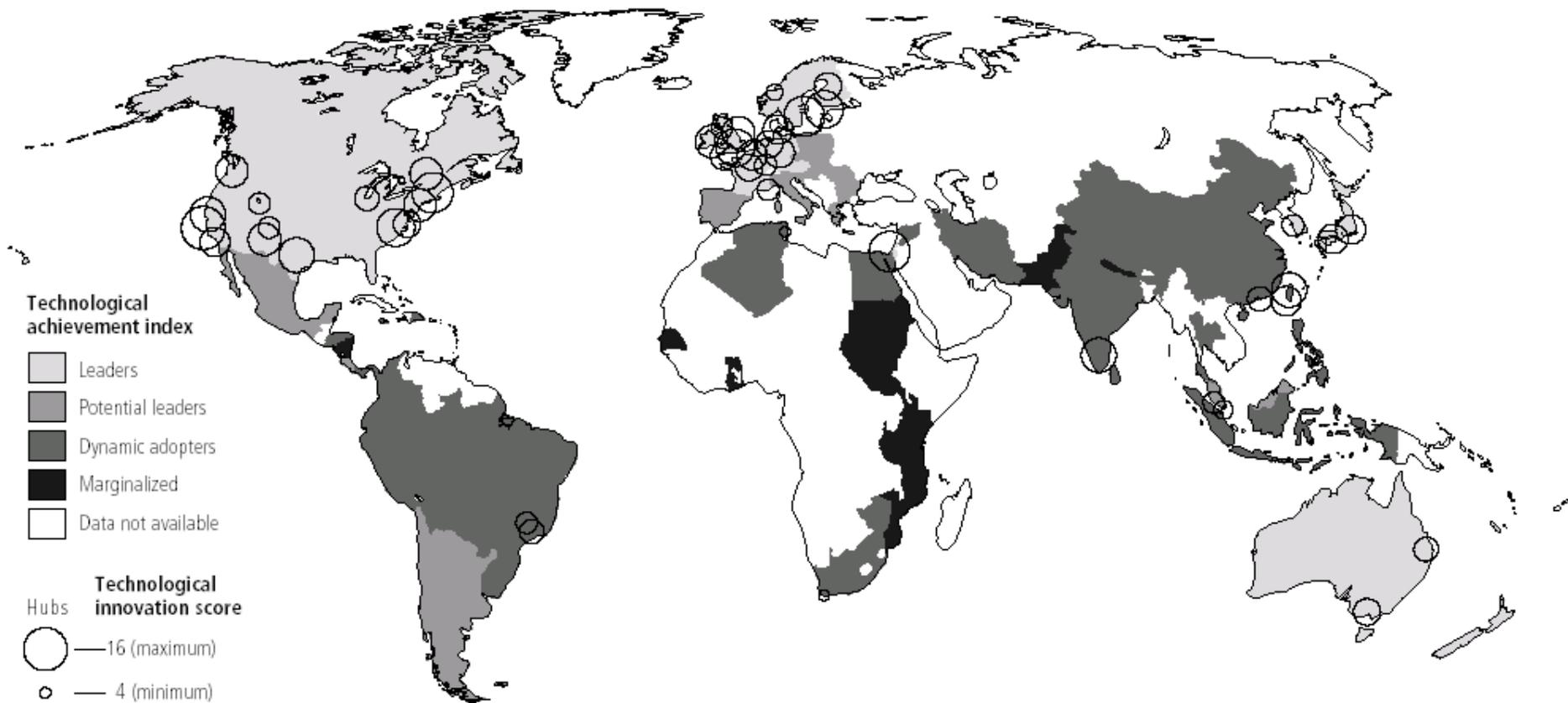
The biomass of earthworms in the organic systems was 30–40 percent higher than in the conventional systems, their density even 50–80 percent higher. Compared to the mineral fertilizer system this difference was even more pronounced.

Maybe we need some newly
designed production lines
which will fit to terms like
Organo - Transgenic Crops
and *Organic Precision*
Biotechnology ?



Zentrum:
virus-resistente Papaya

THE GEOGRAPHY OF TECHNOLOGICAL INNOVATION AND ACHIEVEMENT



Sicherheit
durch
Wissen
schafft



Transgenic Stone Fruit Trees

The project ***"Characterisation of transgenic fruit trees and analyses of direct and indirect biological interactions"*** was developed under the coordination of the IAM.

It is integral part of extensive research programmes and of several institutes of BOKU, aiming to conserve Austrian plant species and cultivars:

The projects belong to the field of basic research, i.e. they should clarify scientific questions without intention of a commercial application. Specific questions concerning safety of transgenic plants are being addressed. The projects are therefore a significant contribution to safety research in Austria.

The research project should:

- ***find out if the genetic modification of the plants remains stable over a prolonged***
- ***investigate possible interactions with the environment and their effects***

BIO-SCOPE

THE INTERNATIONAL EXPERT AND INFORMATION
NETWORK ON FOOD AND AGRIBIOTECHNOLOGY

www.bio-scope.org

Invitation

join the network 'Debate', email to

klaus.ammann@ips.unibe.ch

Let people in their countries
decide on which technology they
want to ad(o)apt,
progress is not always hidden in
new technologies.

We should refrain from
corporate- and eco-imperialism

The introduction of new crops (transgenic or not) is a matter of **complex evaluation**, since we are dealing with field releases into a **complex ecosystem**

Evaluation of complex systems leaves no room for linear planning. Therefore it is wrong to use the **precautionary principle** as a sharply defined planning goal

Rio Declaration 1992

The concept of precaution shall be applied also there where there are threats of serious or irreversible damage
lack full scientific certainty

Instead of using general definitions of the precautionary principle, we need to stick to the original precautionary approach as a planning process case by case

unfortunately, planning problems in the field of green biotechnology have now evolved into **wicked problems** with complex structures and no obvious causal chains

Solving wicked problems
needs new,
second generation
system approaches in
planning

Elements of second
generation planning:
reduce hidden agendas
encourage collaborative
learning atmosphere
Symmetry of ignorance
different kinds of knowledge:

Complexity 1

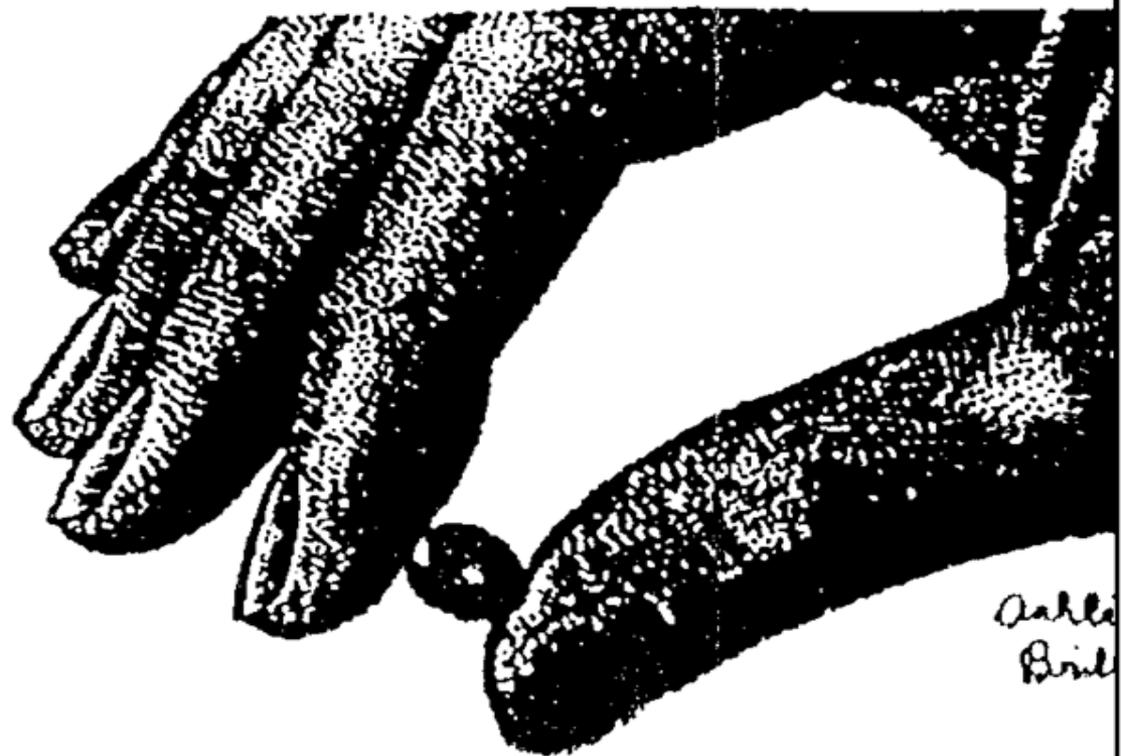
Industry people live in corporate atmosphere of euphemism and perfection, believe in deontic (planning)-knowledge difficulties to understand criticism from outside



ALJI

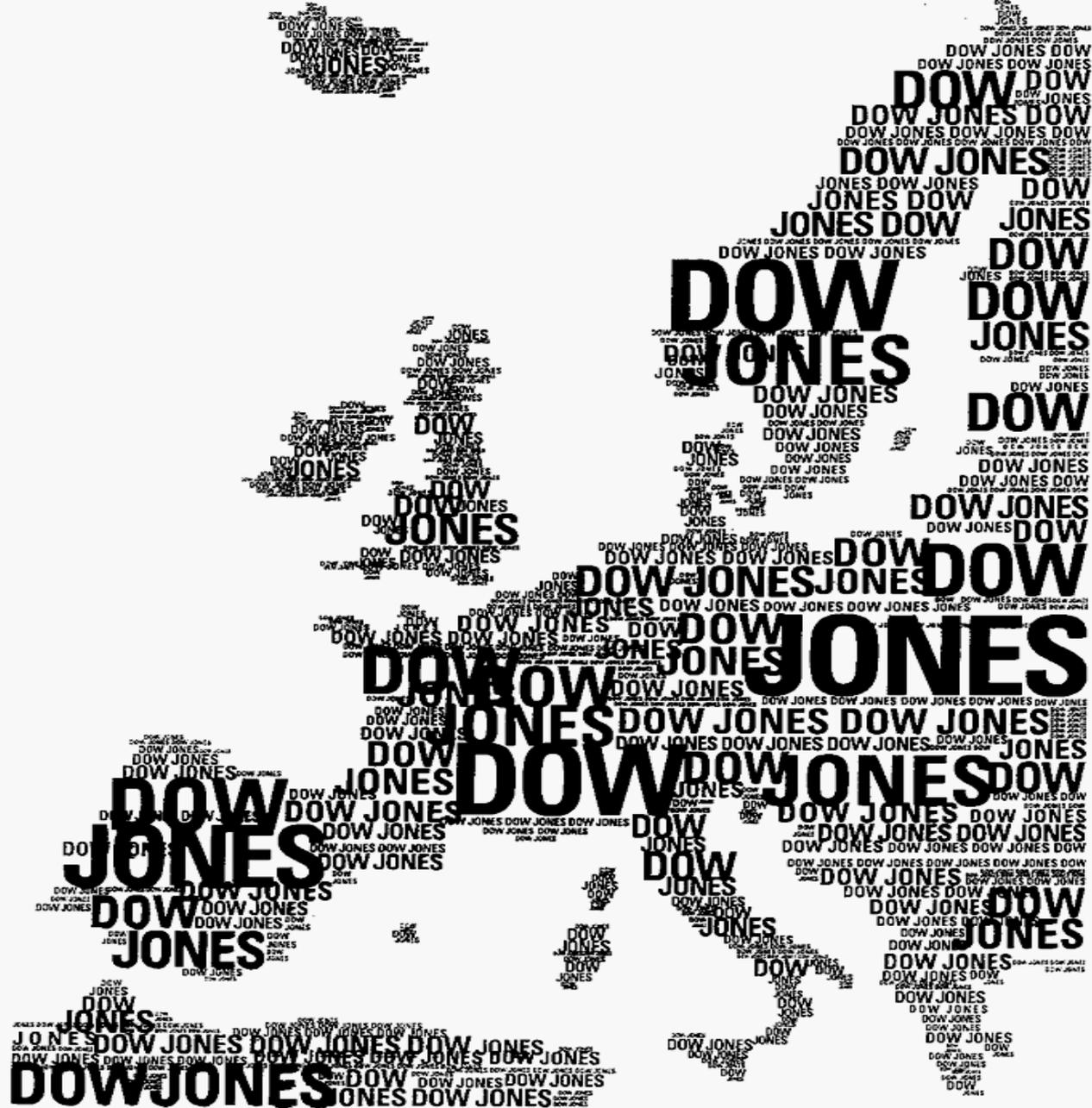
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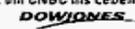


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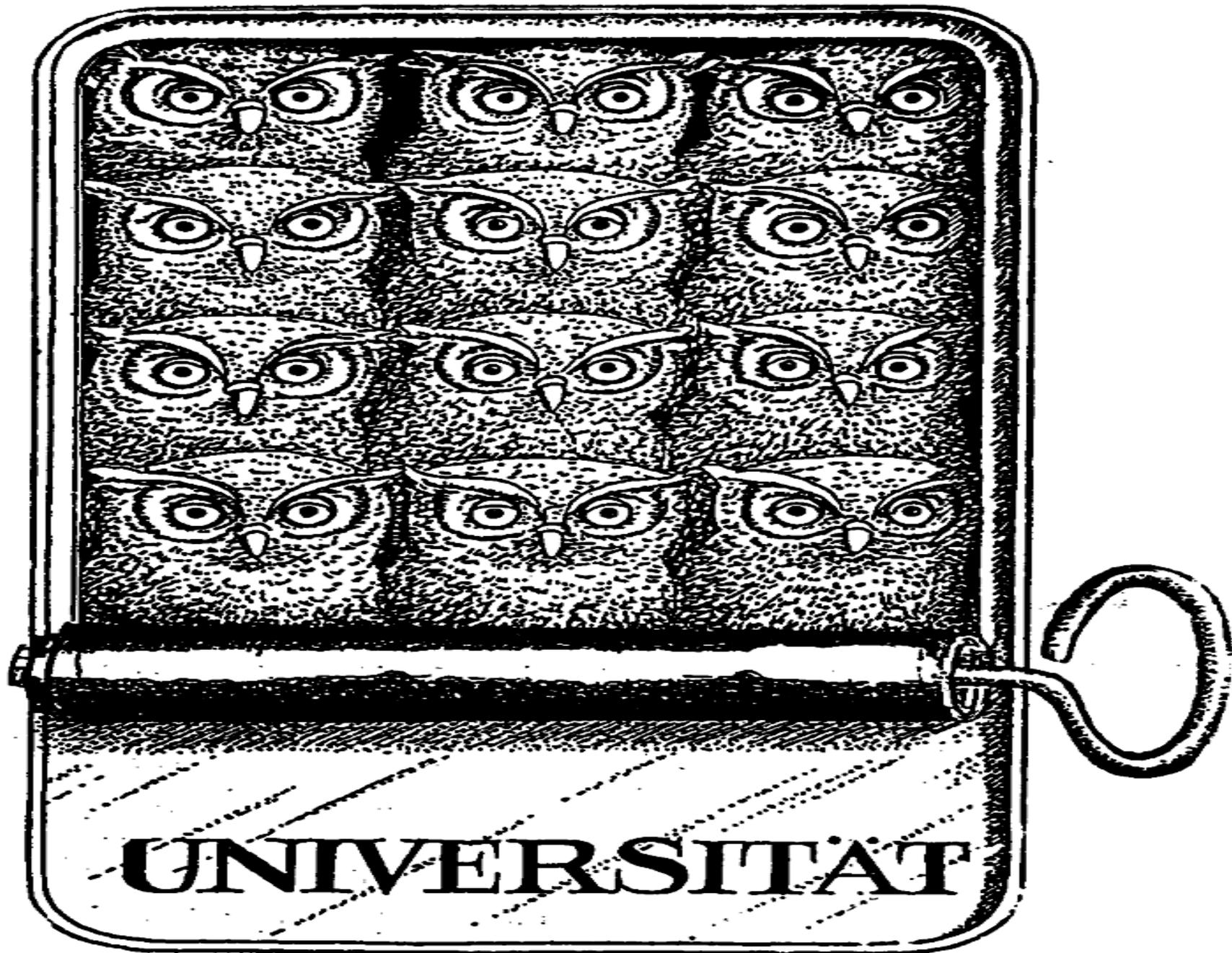


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Complexity 2

Scientists are often naïve and believe in factual knowledge alone, also try to manipulate non-scientists by selecting appropriate facts.

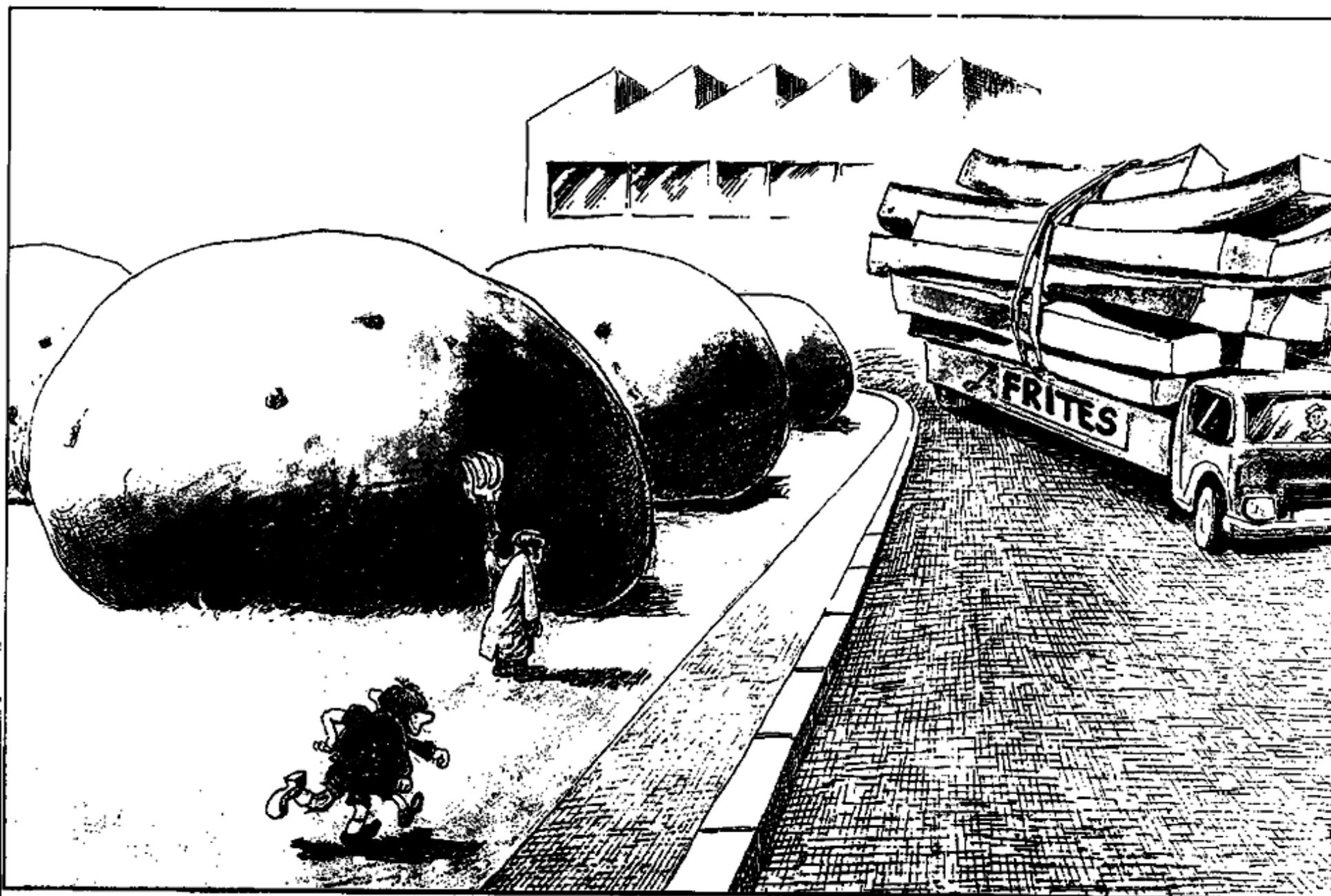


UNIVERSITAT

Complexity 3

Some NGO's have evolved into powerful protest industries, not interested in science which could blur populist argumentation.

Need for regulation,
not censureship



Burki, '24 Heures'

New Experts in the EU

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In his first Online Forum, The Prince of Wales calls for a public debate on whether we need genetically modified crops. ▶

Complexity 4

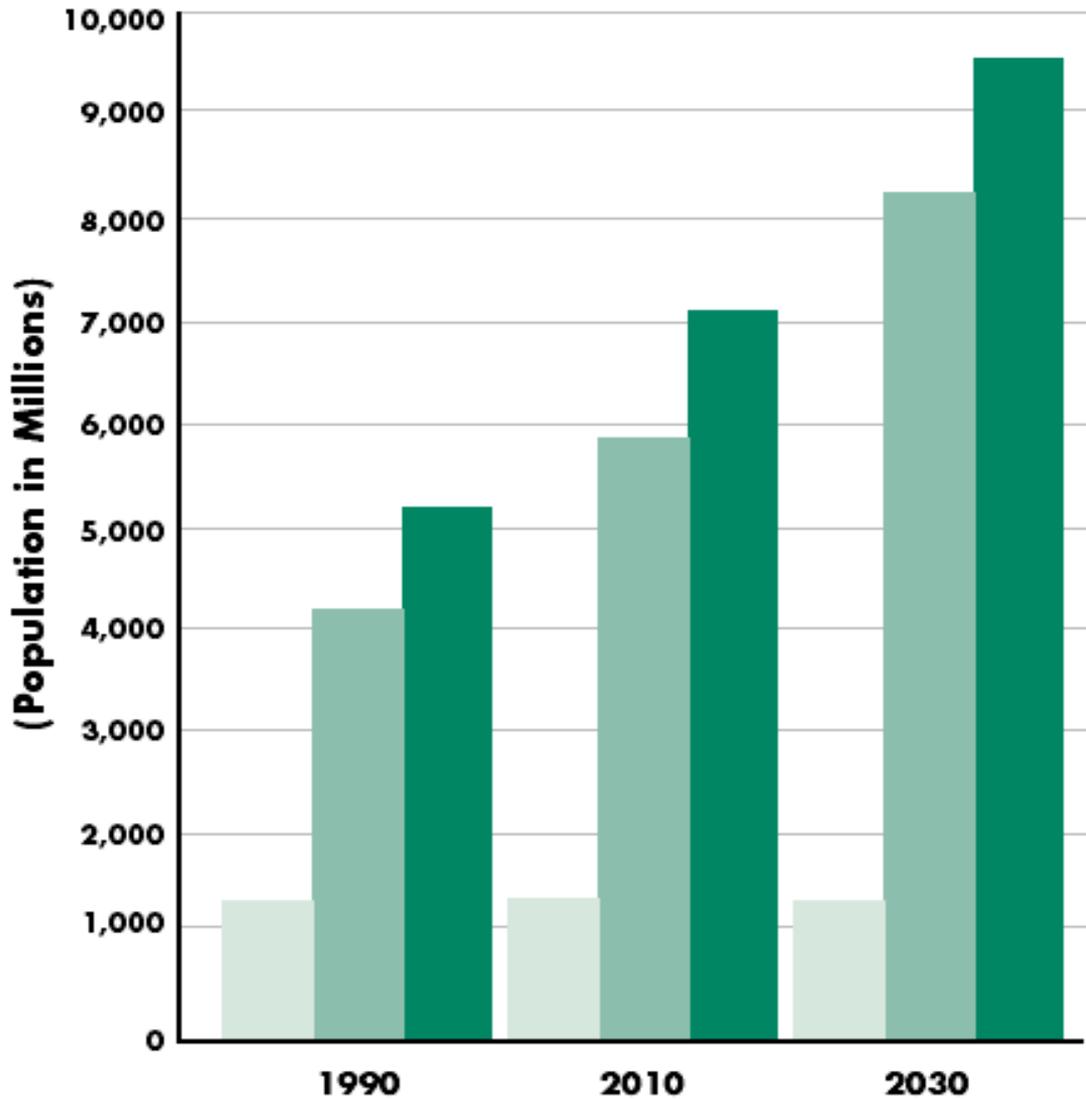
People inbetween do not know whom to believe.

Have a difficult time to accept that biotech criticism and acceptance is a demanding cultural process.

Complexity 5

A comparison between organic, integrated and classic farming has to be based on local traditions, a given local set of crops and taking into account local environmental data.





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 Developing Regions
 World Total

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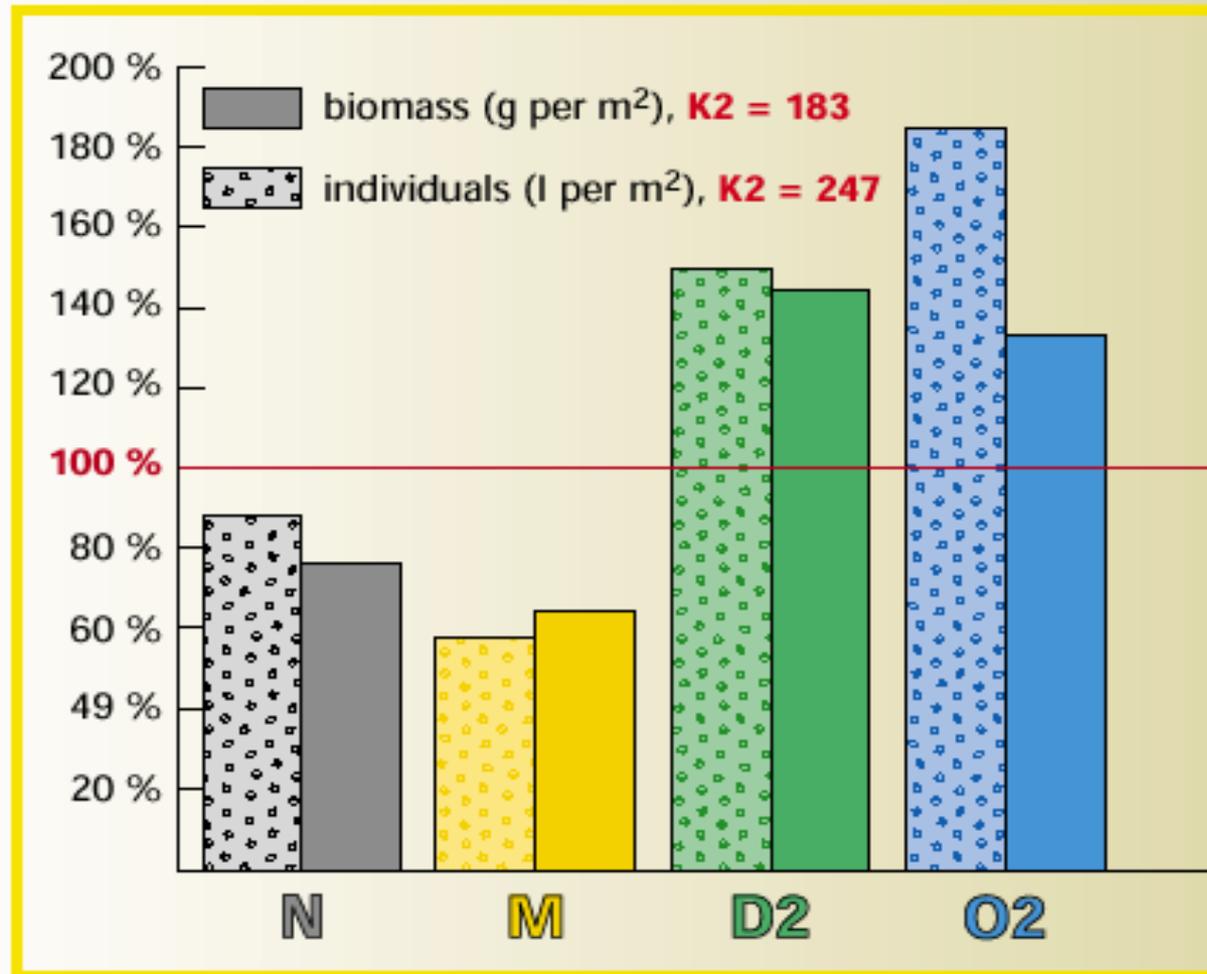
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