

*Agbiotech regulation, risk and benefits:
Perspectives of a public academic scientist*

Alan McHughen, D.Phil.,
University of California
Riverside, Ca USA

alanmc@ucr.edu

FPI Survey (2005)

- Are GM foods in US supermarkets?
- Do ordinary tomatoes contain genes?
- Would a tomato with a fish gene taste “fishy”?
- If you ate a GM fruit, might it alter your genes?
- Can animal genes be inserted into a plant?
- Give an example of GM food on the market

Need for public science literacy

- Public perceptions are often based on:
 - Invalid assumptions
 - Failure to apply critical thinking
 - Lack of context (e.g. chemicals).

Where do people get information?

- Common misconceptions abound...
 - “GE (rDNA) is unnatural because it breaks the nature’s species barrier that precludes genes moving from one species to another”
 - “DNA is a complex protein”
 - “GMOs commercialized with 3 mos to 3 yrs field testing and no long-term safety and environment studies.”

Poor understanding of science leads to poor public policy

- Cartagena Protocol
 - Poor countries have no regulatory infrastructure
 - Theory may be fine...
 - But can't be reduced to practice
- Mendocino County Measure H
 - County legally redefined DNA as a Protein.

Science Communication

- Public needs help understanding science...
 - ...And scientists
- Scientists need help understanding the public
 - ...and encouragement to engage
- Regulators and policymakers need scientific advice to inform regulatory policy
- Citizens need accurate information to make informed decisions.

Who Represents the Public Interest?

- Industry?
- Government?
- Academia?
- NGOs and special interest groups?
- No one...?

The Role of the Public Academic Scientist: Education

- Academic (College and University)
- Cooperative extension
- Community
 - Church halls, life learners, public interest groups, etc.
 - Elementary and secondary schools; Science fairs, etc.

The Role of the Public Academic Scientist: Research & Development

Activities inappropriate for industry or NGOs:

- Biosafety research studies
- Ancillary support: review research proposals, etc.
- R&D beneficial GM products unsuitable for private development (those with broad public benefit, but not necessarily commercially viable; minor crops, uncontrolled i.p., limited means of investment recovery, etc.).

The Role of the Public Academic Scientist: Public Service

- Advising policy (largely theoretical)
 - Regulatory agencies
 - NAS
 - Environment, Food safety, Biocontainment, etc.
- Solving problems (largely practical)
 - Coexistence
 - Overcoming obstacles to deployment of Biotech products with public benefit.

Traditional approach to Risk

■ Component

- Risk Assessment
- Risk Management
- Risk Communication

■ Responsibility

- Scientists
- Regulators
- No one,
everyone, ???

Should the public academic scientist fill this role, too?

Overcoming problems: Coexistence

- Coexistence is not new
 - Wheat:
 - Barley:
 - Canola:
 - Corn:
 - Mandarin oranges:

Coexistence: organic and GM

- California (SLO Co.)
 - Brokered by UC
 - Demands neighborly cooperation
 - Characteristic of farmers worldwide
- European Union
 - Denmark (2005)
 - State pays compensation for actual losses to organic
 - (but collects \$\$\$ from GM farmers)
 - Based on separation distances;
 - Rejects 'zero tolerance'; sets thresholds.

Overcoming obstacles to deploy beneficial GM products

- Major obstacles:
 - Intellectual property (i.p.)
 - PIPRA
 - Regulatory compliance costs
 - SCRI.

Conclusions

- Environment is under threat by human activity
- 6.2 billion humans is not 'natural' and not sustainable
- Ecological and health safety requires good science
- As well as good policy....

An informed populace requires scientifically expert champions working in the public interest.