

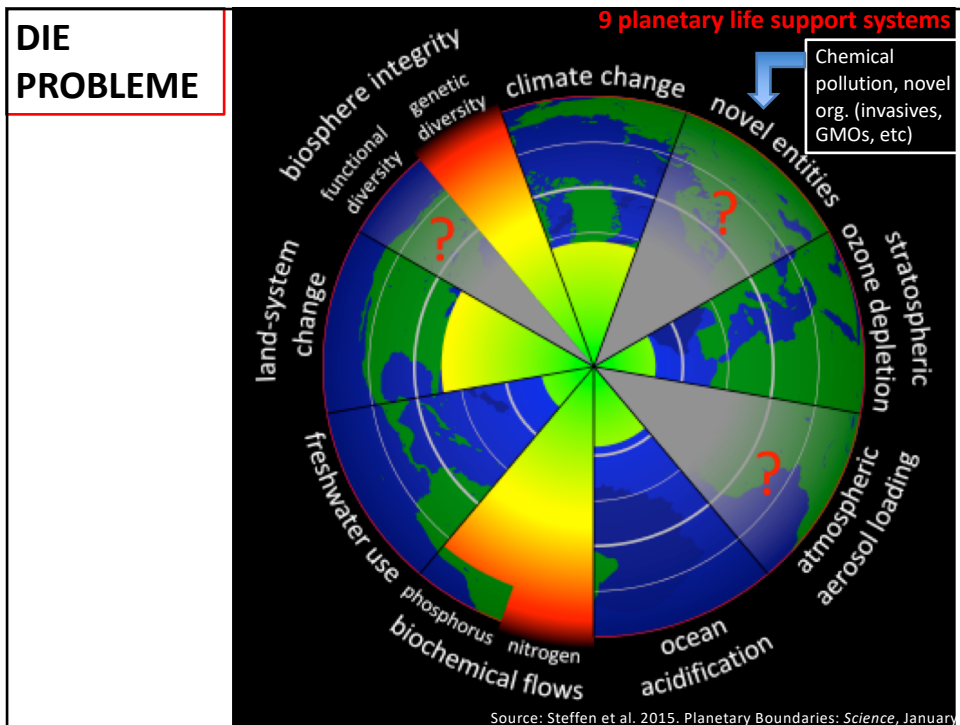
Wenig Hoffnung auf LÖSUNGEN DER GENTECHNIK

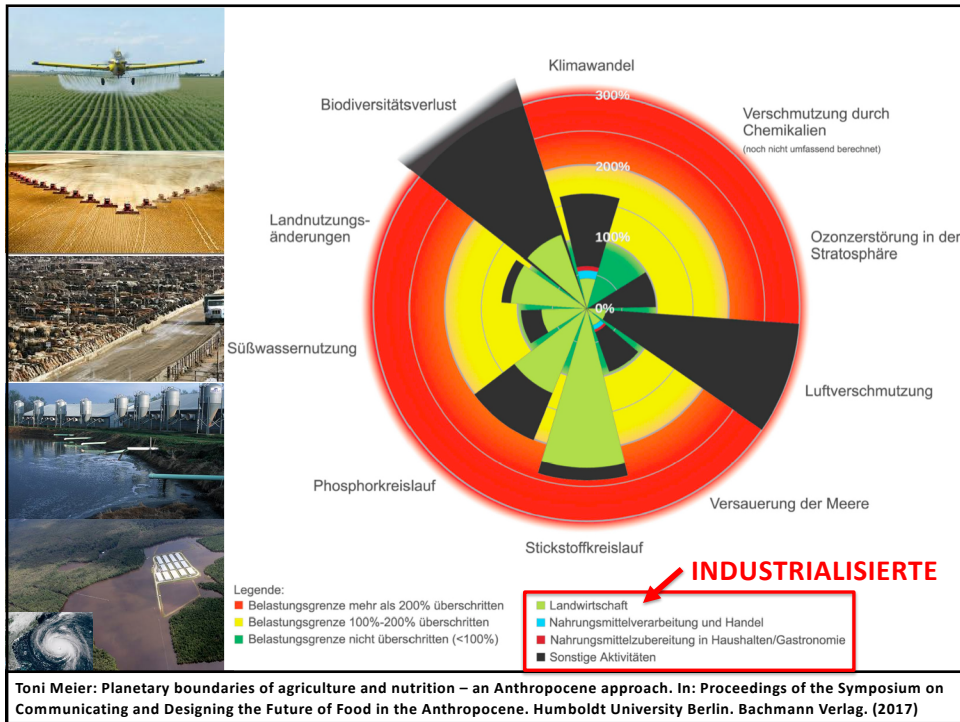
Dr. Angelika Hilbeck

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Gruppe: Umweltbiosicherheit und Agrarökologie

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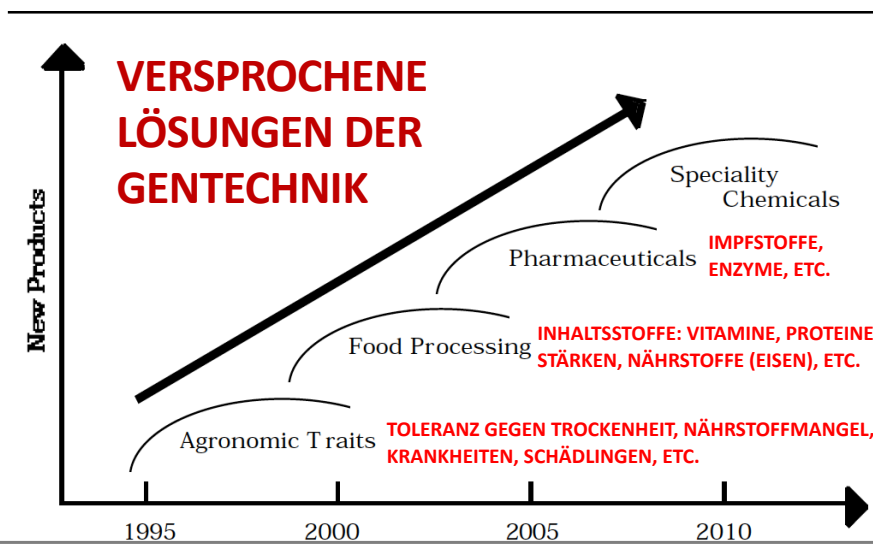




The Contributions of Plant Biotechnology to Agriculture in the Coming Decades, R. T. Fraley

Krattiger, A.F. and A. Rosemarin. 1994. Biosafety for Sustainable Agriculture: Sharing Biotechnology Regulatory Experiences of the Western Hemisphere.

Figure 2: Plant Biotechnology Promises to Deliver Many New Products in Coming Decades



VERSPROCHENE LÖSUNGEN DER GENTECHNIK

Editor's Choice

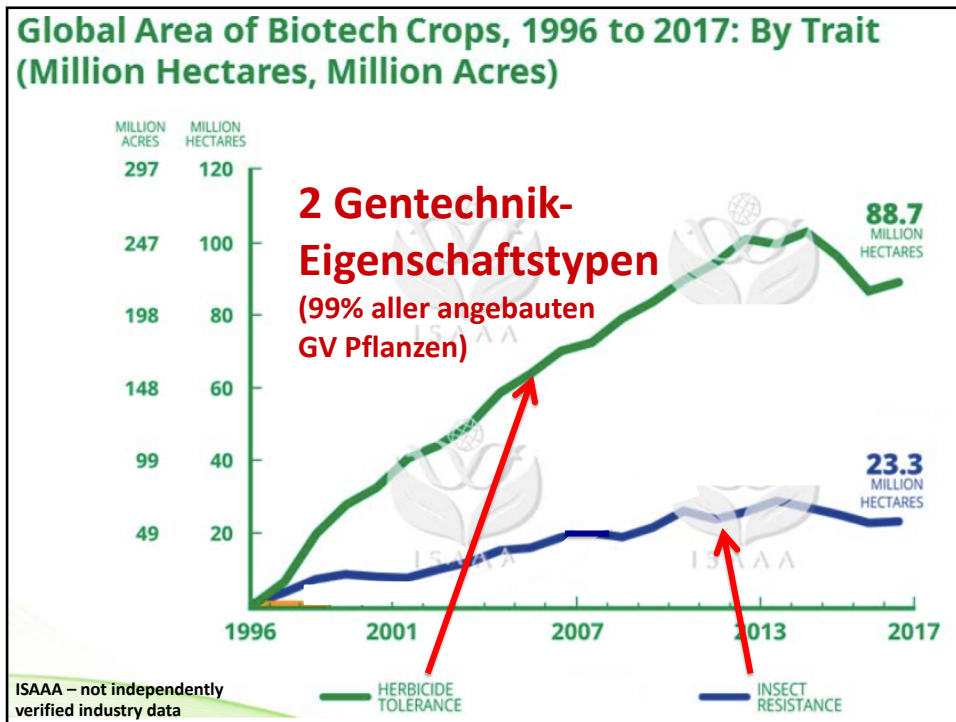
Plant Physiol. Vol. 124, 2000

Ending World Hunger. The Promise of Biotechnology ...

Norman E. Borlaug
Nobel Prize Laureate for Peace, 1970

REALITÄTSCHECK nach ...

- über 65 Jahren seit der Entdeckung DNA
- über 45 Jahren seit der Entdeckung der 'molekularen Scheren' und anderen Werkzeugen für Herstellung von GVOs
- über 20 Jahren weltweiten kommerziellen Anbaus und Zulassung von GVOs
- 7 Jahren seit der Entwicklung von CRISPR Cas9





Eigenschaftstyp I Resistent gegen Herbizid



EPSPS Enzym
Agrobacterium tumefaciens








Eigenschaftstyp II Produzieren Insektizid



Bacillus thuringiensis; bacterial spore, mother cell and parasporal crystals

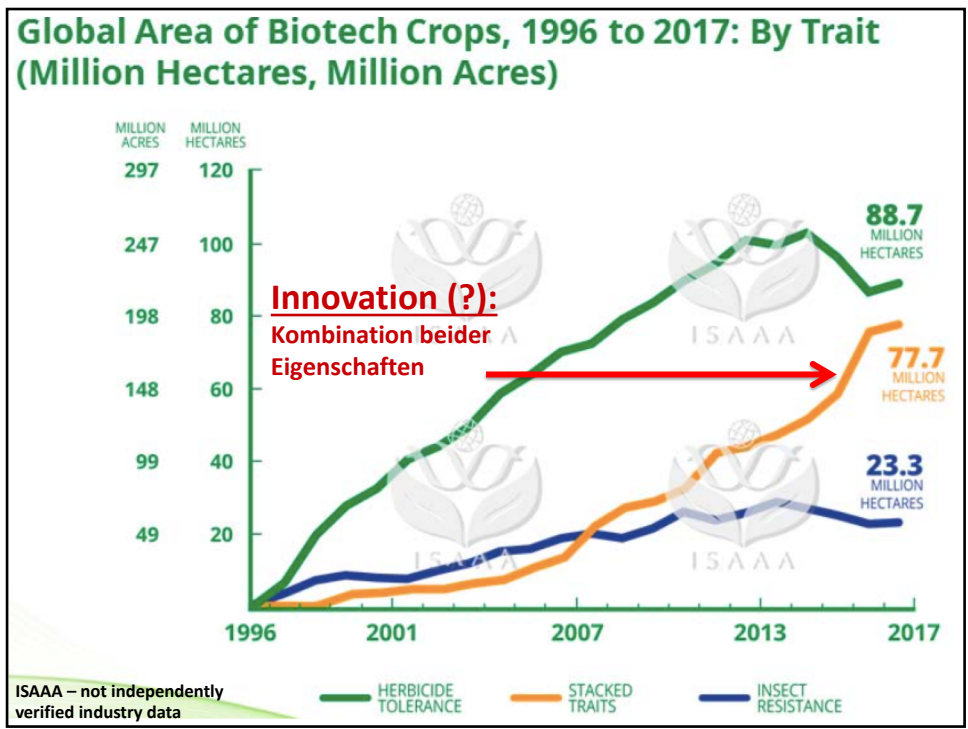
Bt Toxine

Insektizid in die Pflanze eingebaut



Bt Gene is inserted into crop.

infected by corn borer Pest dies when feeding on any plant part



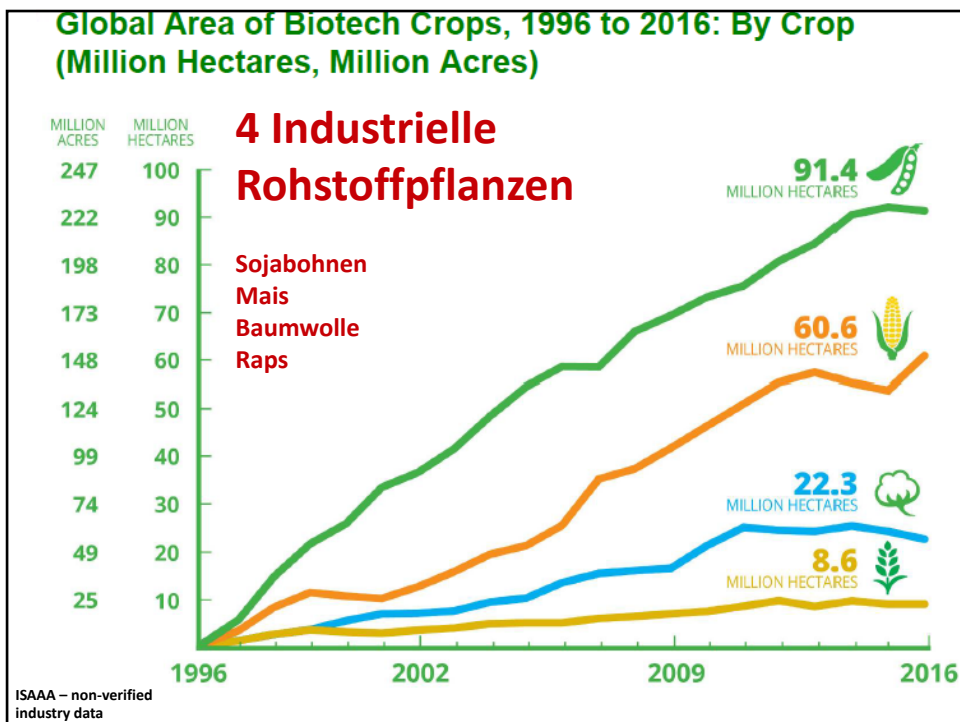
Produzieren Insektizid + Resistent gegen Herbizid

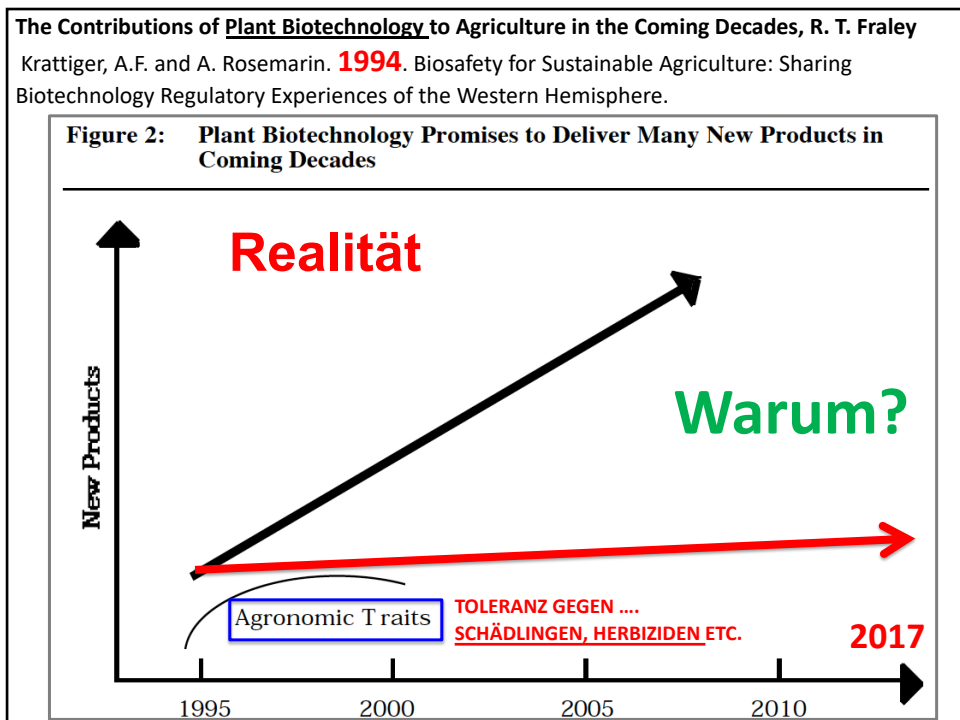
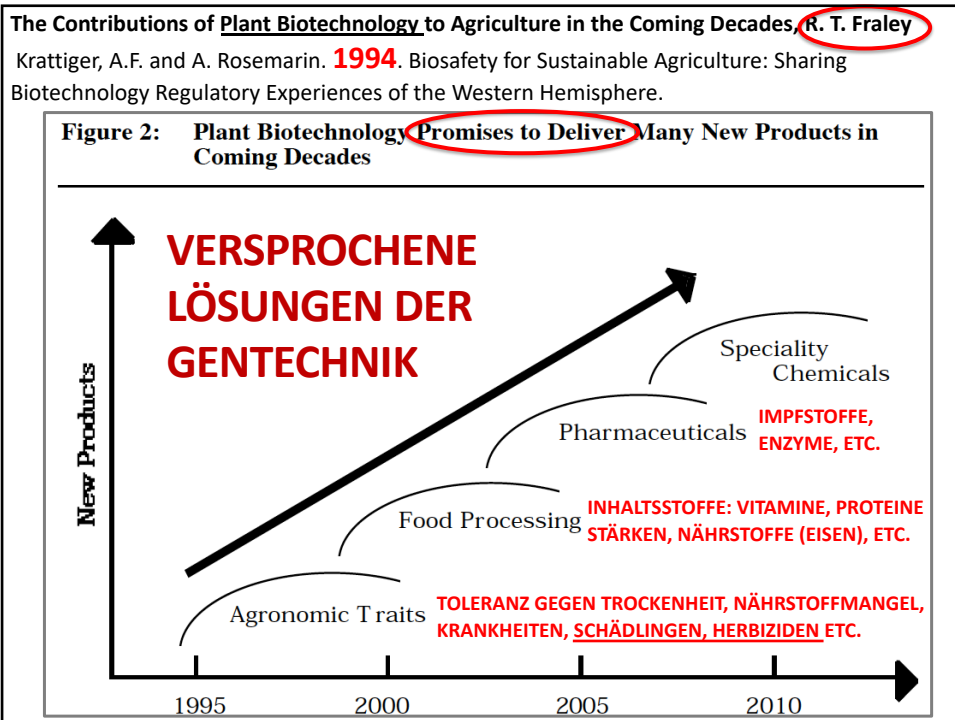
Insektizid in die Pflanze eingebaut

Bt Gene is inserted into crop

Pest dies when feeding on any plant part

Plattformen für Chemie





Gentechnik baut auf veralteter Wissenschaft

Annahmen:

- Nukleotidesequenzen von Organismus A funktioniert in Organism B ausschliesslich wie in A

Daraus abgeleitete Annahmen:

- Nukleotide/DNA = (Digital) CODE (des Lebens)
 - ➔ Genetik = eine Form der digitalen Informationstechnology (IT)
 - ➔ Kontrolle über DNA = Präzision = Sicherheit = Vorhersagbarkeit

‘Central Dogma’

‘Synthetic Biology’ Fantasien

“Intentional Biology”

“Digital Biology”

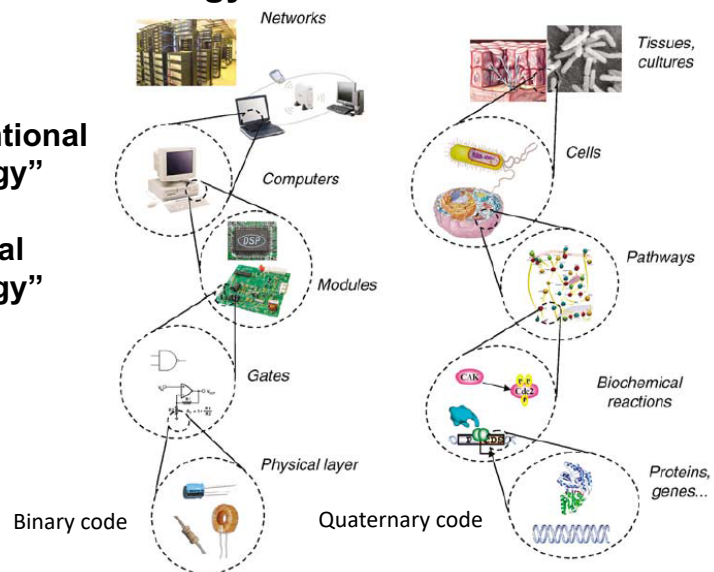
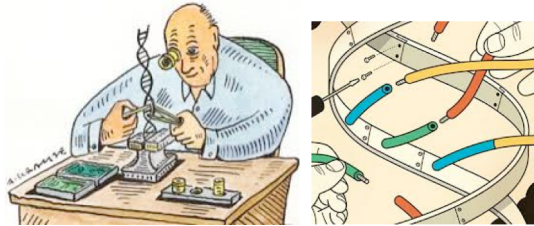


Figure 1 A possible hierarchy for synthetic biology is inspired by computer engineering.

Andrianantoandro et al. 2006

Veraltete Annahmen:

- **Reduktionistisch-simplistische Sichtweise: Organismen sind die Summe ihrer gen-'kodierten' Bausteine**

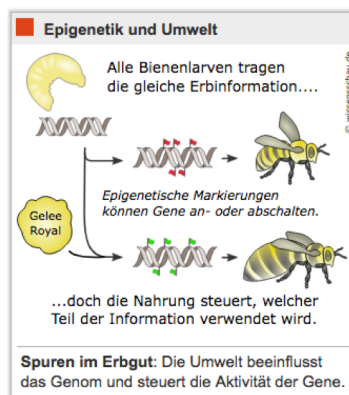


- **Gentechnik limitiert: kann nur Eigenschaften verändern, die von Einzelgenen beeinflusst werden (Punktmutationen) (einfache Eigenschaften)**

Die Umwelt – Ein Problem!

“Environmental information

*Random, or **stochastic**, signals can **generate significant noise in biological systems...**”*



HARPER'S
MAGAZINE

Unraveling the DNA myth

The spurious foundation of genetic engineering

Barry Commoner (Senior scientist at the Center for the Biology of Natural Systems at Queens College, City University of New York)

Harper's Magazine, February **2002**

“DNA did not create life; life created DNA

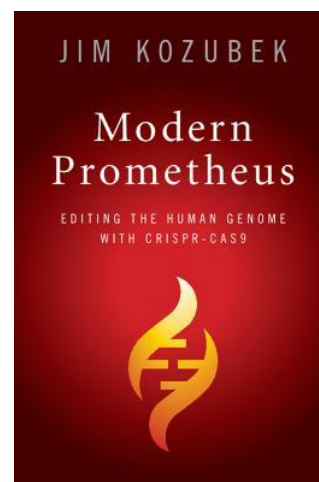
Why, then, has the central dogma continued to stand? To some degree the theory has been protected from criticism by a device more common to religion than science: dissent, or merely the discovery of a discordant fact, is a punishable offense, a heresy that might easily lead to professional ostracism.

The central dogma was simply too good not to be true.”

Seit 2012, neue ‘Scheren’ tauchen auf begleitet von alten Versprechen



CRISPR-Cas9 – der neue Hype!





BIOLOGY | GENETICS

It's the End of the Gene As We Know It

We are not nearly as determined by our genes as once thought.

BY KEN RICHARDSON
JANUARY 3, 2019

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We've all seen the stark headlines: "Being Rich and Successful Is in Your DNA" (*Guardian*, July 12); "A New Genetic Test Could Help Determine Children's Success" (*Newsweek*, July 10); "Our Fortunetelling Genes" make us (*Wall Street Journal*, Nov. 16); and so on.

The problem is, many of these headlines are not discussing real genes at all, but a crude statistical model of them, involving dozens of unlikely assumptions. Now, slowly but surely, that whole conceptual model of the gene is being challenged.

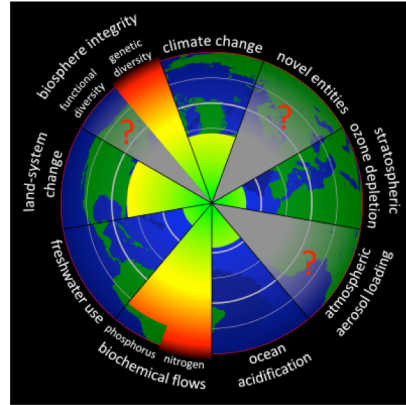
We have reached peak gene, and passed it.

ISSUE 068
CONTEXT
 EXPLORE THIS ISSUE

CHAPTER ONE
 DESIGNED



DANKE!



**Hoffnung auf
Lösungen der
Gentechnik für
diese Probleme
sehr limitiert**