

# Risks and benefits of pest management methods



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No endorsement intended or implied

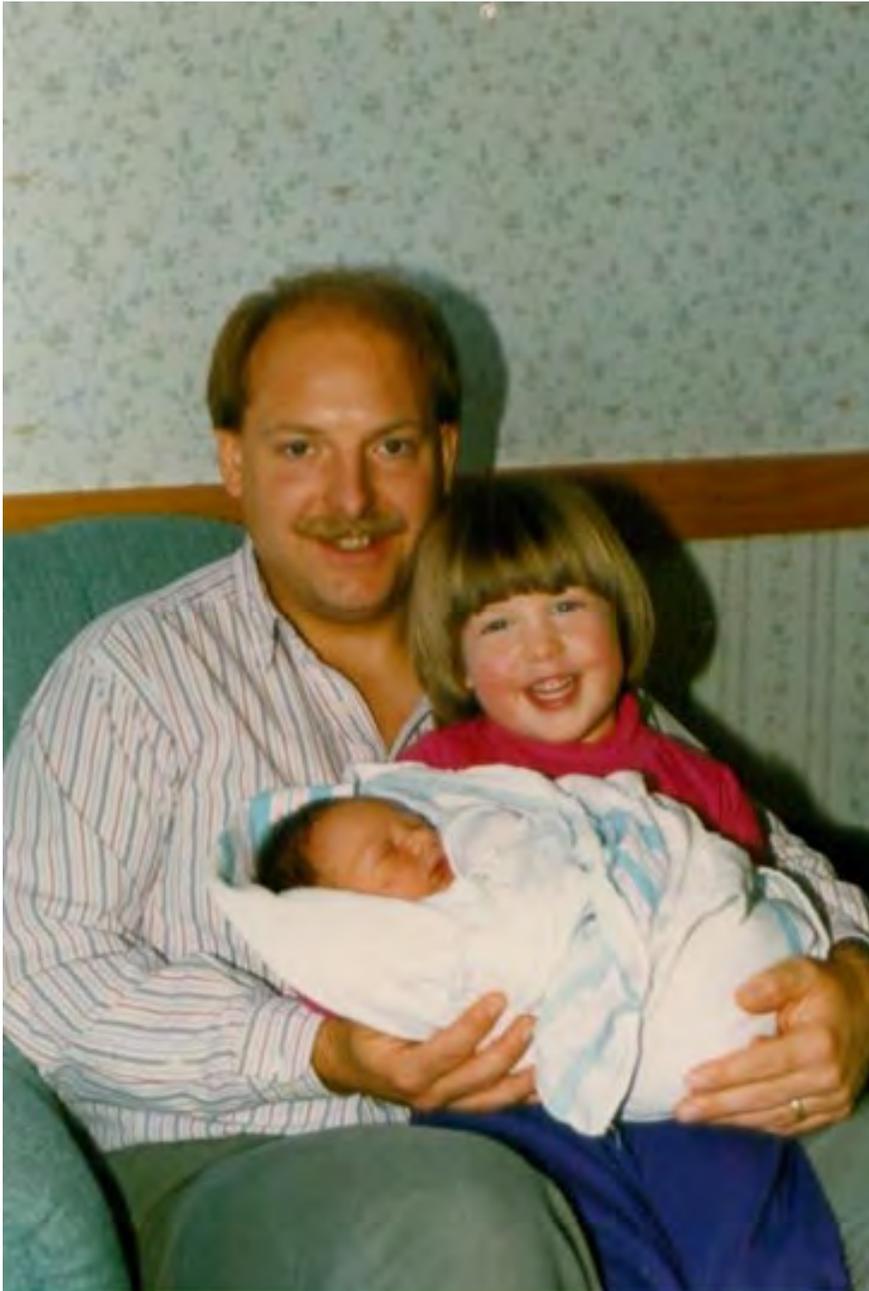
*Tetrastichus planipennisi* — David Cappaert

5402604



# Why this topic?

- ❖ I love Maine
- ❖ I worry about the future for our next generations
- ❖ I worry about the lack of trust in science
- ❖ I worry about the lack of trust in government and industry



First and foremost, I am a father and want my children and hopefully, grandchildren, to enjoy a livable world

## Middle East faces severe wheat crisis over war in Ukraine

Middle Eastern and North African countries rely heavily on wheat imports from Russia and Ukraine. The current war could lead to a severe food crisis in a region already under pressure.



Ukrainian and Russian wheat has been crucial for the Middle East's food security

## Europe Eyes Grains Import Waiver Amid War Shock, Spain Says

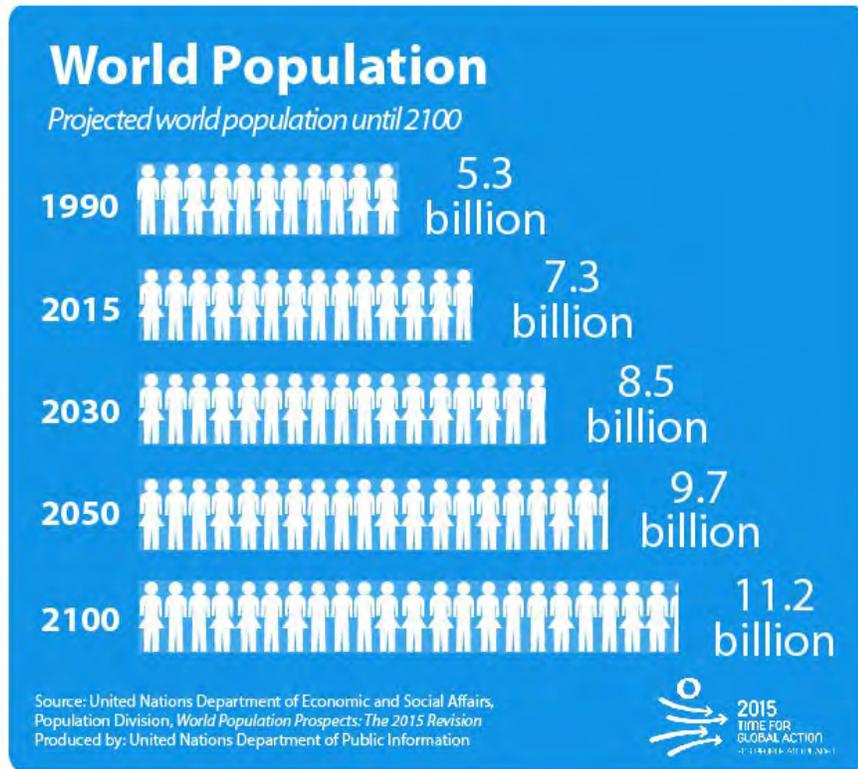
- Minister Planas proposes temporary lift ban on some GMO crops
- EU must aim to have output goals for protein crops, fertilizer



Photographer: Daniel Acker/Bloomberg

# Will there be food shortages?

# Will we be able to feed the world



According to estimates compiled by the Food and Agriculture Organization (FAO), **by 2050 we will need to produce 60 per cent more food to feed a world population of 9.3 billion**



# Panta Rhei...

Everything is always moving and changing



**Roundup**  
linked to:  
**NON-HODGKIN'S  
LYMPHOMA**

Dramatization

**Over \$78 MILLION**  
awarded to a Non-Hodgkin's Lymphoma victim.

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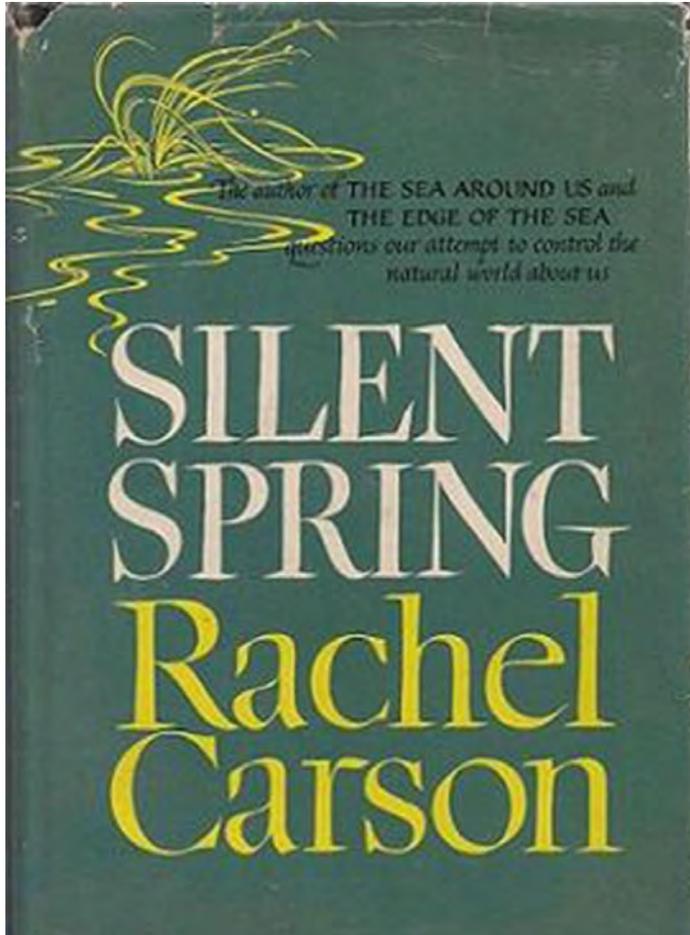
Seeing all those Roundup commercials? That's because lawyers have spent \$60M on them this year



Cartoon Credit: Other Words

# Why worry?

- ❖ Public opinions are swayed by lawyers, social media and Madison Avenue
- ❖ Honest work done by risk assessors and scientists all over the world is drowned out
- ❖ Political decisions often disregard the science in favor of public opinion
- ❖ The pursuit of a “clean” risk free life is wishful thinking and likely to backfire

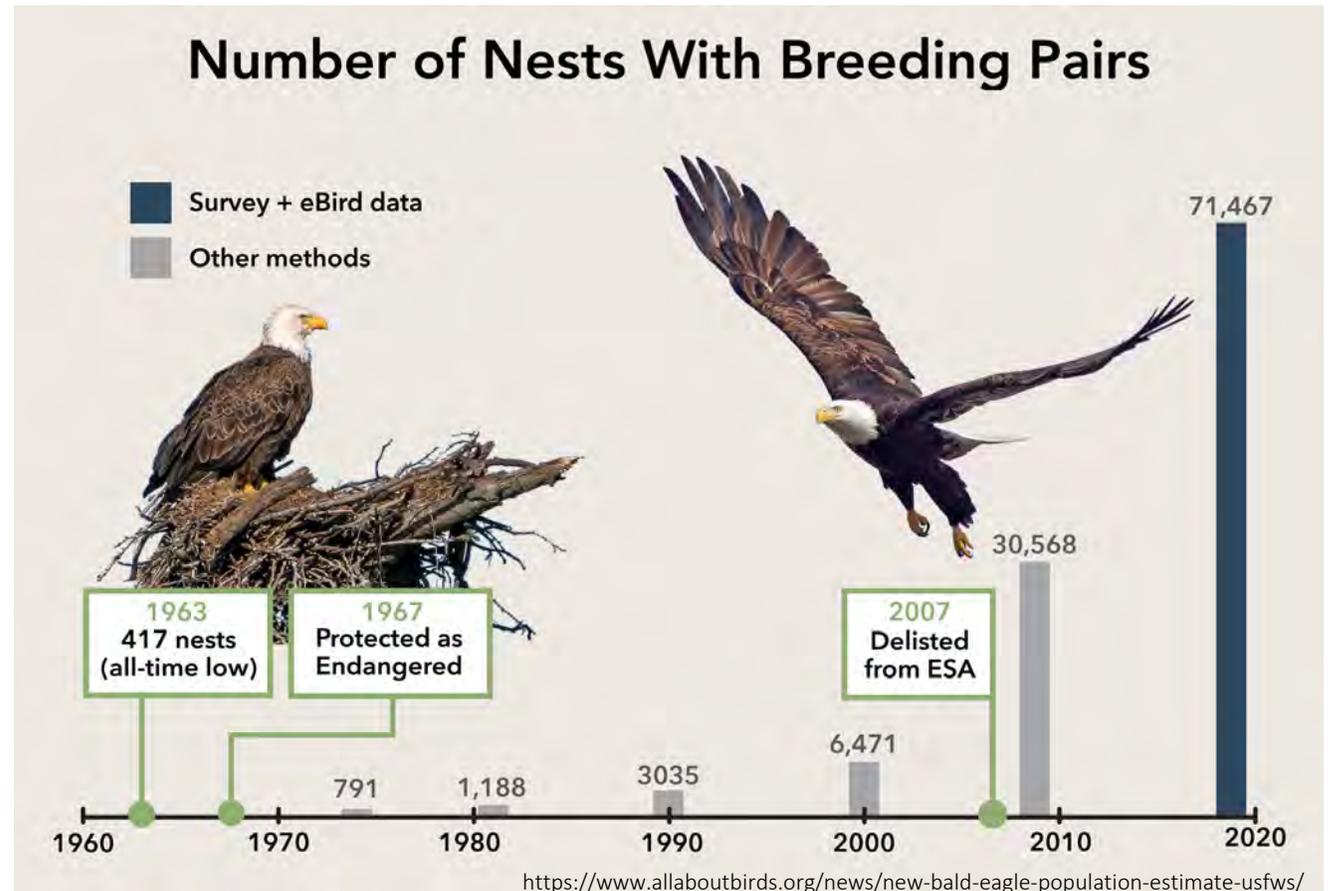


## Since Silent Spring

- ❖ Do we remember what it was like in the 60s?
- ❖ What has changed?
- ❖ Have the changes improved sustainability and water quality?

<https://www.magellantv.com/articles/the-insect-apocalypse-and-pesticides-has-rachel-carsons-silent-spring-arrived>

Our national bird may be one indicator





<https://earth5r.org/polluted-water-androscoggin-river/>



Kenneth C. Zirkel

# Major changes in my lifetime

ISSUED JULY 1956

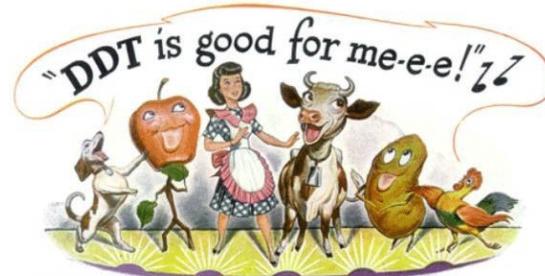
# Control of the Corn Earworm

by D. D. POND

# ATTRIBUTE® SWEET CORN TRAIT STACKS

## Insect Control

 Attribute Trait stacks	 Attribute Plus Trait stacks	 Attribute II Trait stacks
Cry1Ab	Vip3A + Cry1Ab	Vip3A + Cry1Ab



PENNSYLVANIA SALT MANUFACTURING COMPANY  
WIDENER BUILDING, PHILADELPHIA 7, PA.

## Attribute Plus and Attribute II Spectrum of Control

Beet Armyworm ( <i>Spodoptera exigua</i> )	Dingy Cutworm ( <i>Feltia jaculifera</i> )	Southwestern Corn Borer ( <i>Diatraea grandiosella</i> )
Black Cutworm ( <i>Argotis ipsilon</i> )	European Corn Borer ( <i>Ostrinia nubilalis</i> )	Sugarcane Borer ( <i>Diatraea saccharalis</i> )
Common Stalk Borer ( <i>Papaipema nebris</i> )	Fall Armyworm ( <i>Spodoptera frugiperda</i> )	Western Bean Cutworm ( <i>Striacosta albicosta</i> )
Corn Earworm ( <i>Helicoverpa zea</i> )	Southern Cornstalk Borer ( <i>Diatraea crambidoides</i> )	

<https://www.syngenta-us.com/>

## INSECTICIDES AND RATES OF APPLICATION

The earworm may be controlled by 2 applications of insecticide at 5-day intervals. The first application should be made when the eggs are first detected on the silk. Several insecticides are effective. Of these, DDT and DDD are outstanding. Emulsions are more effective than wettable powders. Adding mineral oil increases the effectiveness of wettable powders but not of emulsions.

On large acreages, apply one of the following:

DDT, 20% emulsifiable concentrate	1 gallon
Water	24 gallons

or

DDD, 50% wettable powder	8 pounds
Water	25 gallons

# DDT to Bacillus thuringiensis



The great expectations held for DDT have been realized. During 1946, exhaustive scientific tests have shown that, when properly used, DDT kills a host of destructive insect pests, and is a benefactor of all humanity.

Pennsalt produces DDT and its products in all standard forms and is now

one of the country's largest producers of this amazing insecticide. Today, everyone can enjoy added comfort, health and safety through the insect-killing powers of Pennsalt DDT products . . . and DDT is only one of Pennsalt's many chemical products which benefit industry, farm and home.



**GOOD FOR STEERS**—Beef grows meatier nowadays . . . for it's a scientific fact that—compared to untreated cattle—beef-steers gain up to 50 pounds extra when protected from horn flies and many other pests with DDT insecticides.



**KNOX FOR THE HOME**—helps to make healthier, more comfortable homes . . . protects your family from dangerous insect pests. Use Knox-Out DDT Powders and Sprays as directed . . . then watch the bugs "bite the dust"!



**KNOX FOR DAIRIES**—Up to 20% more milk . . . more butter . . . more cheese . . . tests prove greater milk production when dairy cows are protected from the annoyance of many insects with DDT insecticides like Knox-Out Stock and Barn Spray.



**GOOD FOR FRUITS**—Bigger apples, juicier fruits that are free from unsightly worms . . . all benefits resulting from DDT dusts and sprays.



**GOOD FOR ROW CROPS**—25 more barrels of potatoes per acre . . . actual DDT tests have shown crop increases like this! DDT dusts and sprays help truck farmers pass these gains along to you.



**KNOX FOR INDUSTRY**—Food processing plants, laundries, dry cleaning plants, hotels . . . dozens of industries gain effective bug control, more pleasant work conditions with Pennsalt DDT products.

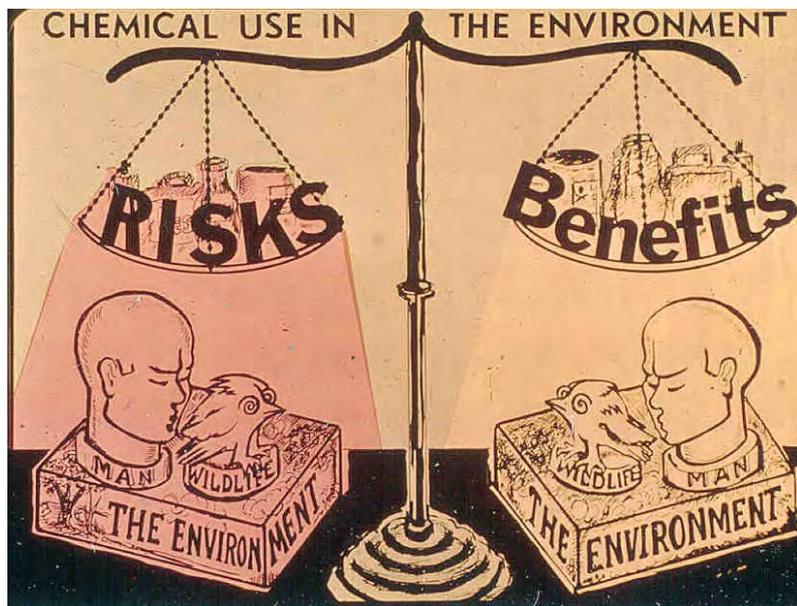


97 Years' Service to Industry • Farm • Home

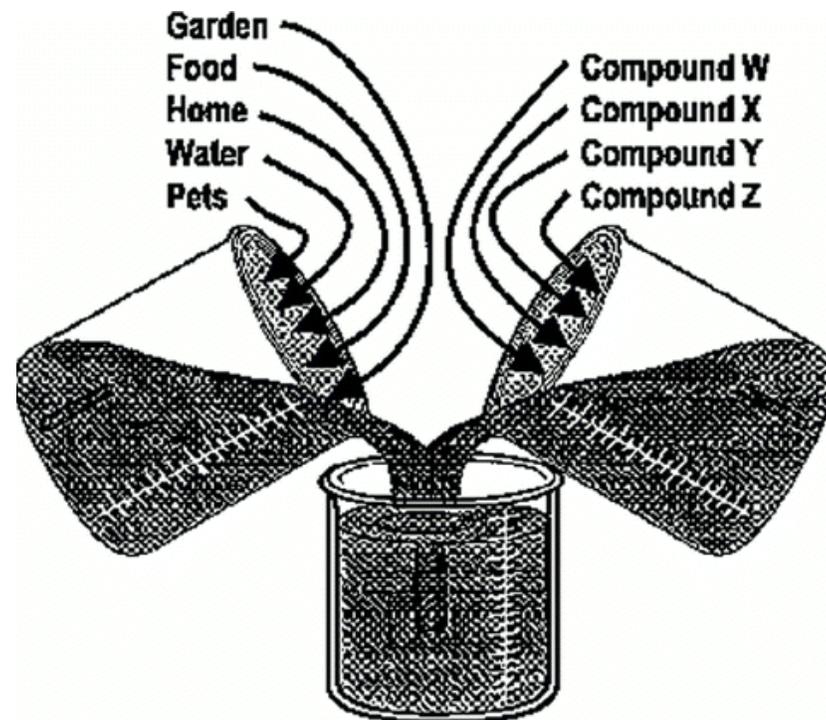
PENNSYLVANIA SALT MANUFACTURING COMPANY  
WIDENER BUILDING, PHILADELPHIA 7, PA.

Pressures on poor countries to ban the insecticide DDT because of fears that its use would harm the environment have led to a resurgence of malaria in the world, yet the environmental impact of its use are "negligible,"

# Reasonable certainty of no harm



Prior to 1996 FQPA



After 1996 FQPA



# Food Quality Protection Act of 1996

- ❖ mandated a single, health-based standard for all pesticides in all foods
- ❖ provided special protections for infants, children and immune compromised
- ❖ expedited approval of safer pesticides
- ❖ required periodic re-evaluation of pesticide registrations and tolerances to ensure that the scientific data supporting pesticide registrations remain up to date



19. Nature Fights Back

To most insects so much in our efforts to hold nature to our instructions and yet to have failed in achieving our goal would indeed be the first step. Yet this, it seems, is our situation. The earth seldom remained but there for us to use, in that nature is not so easily ruled, and since the insects are finding ways to circumvent our chemical attacks on them.

"The insect world is nature's most amazing phenomenon," said the Dutch biologist C. J. Bricher. "Nothing is impossible to it, the most impossible things commonly occur there. One who penetrates deeply into its operations is constantly beset by new wonder. He knows that something can happen, and that the completely impossible often does."

Silent Spring – Lois & Louis Darling

# Integrated Pest Management



# Benefits and risks of GM foods

Review

## Myths and Realities about Genetically Modified Food: A Risk-Benefit Analysis

Angelo Vega Rodríguez <sup>1</sup>, Cristina Rodríguez-Oramas <sup>1</sup>, Esther Sanjuán Velázquez <sup>1</sup>, Arturo Hardisson de la Torre <sup>2</sup>, Carmen Rubio Armendáriz <sup>2</sup>  and Conrado Carrascosa Iruzubieta <sup>1,\*</sup> 

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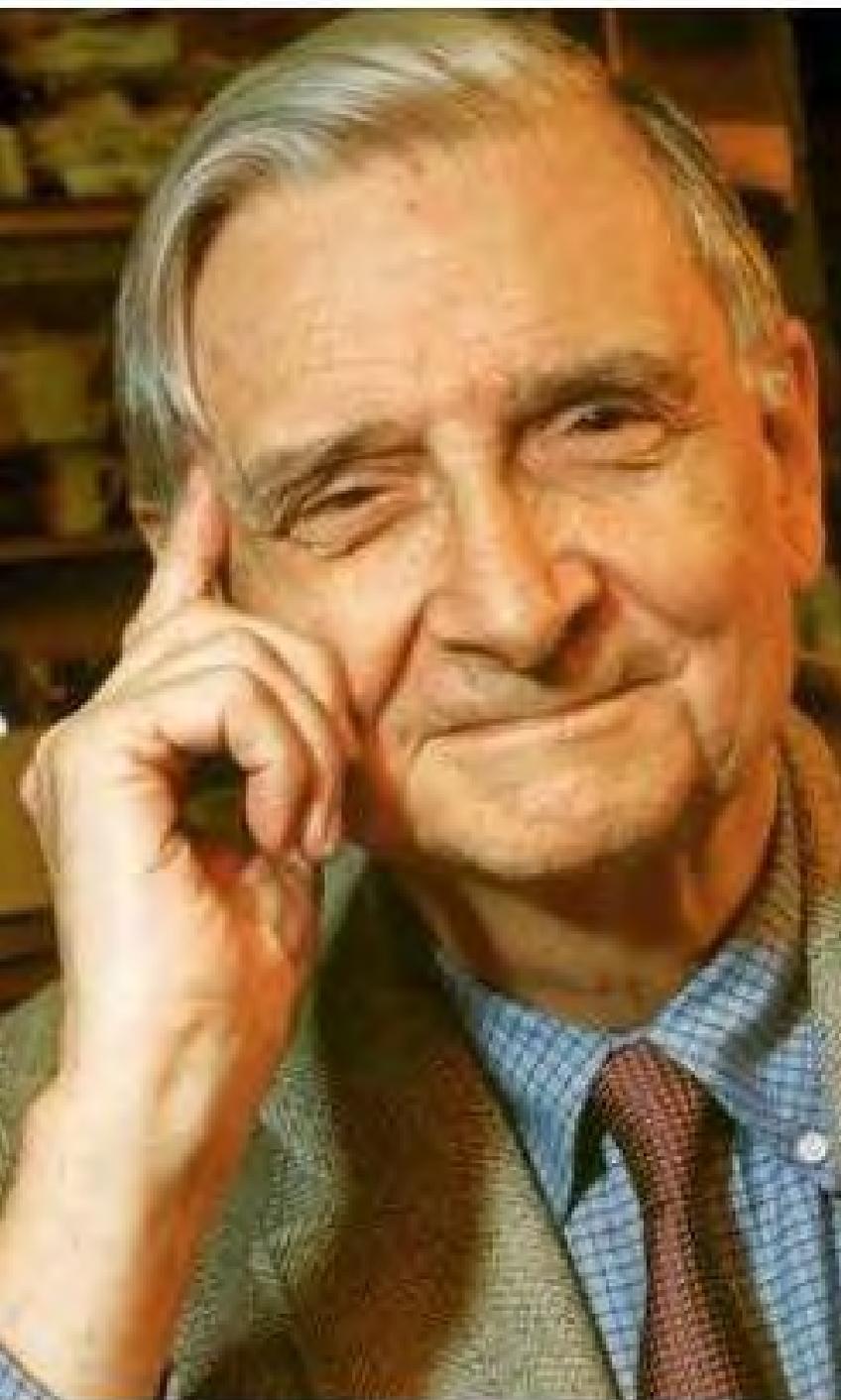
<sup>2</sup> Department of Obstetrics and Gynecology, Pediatrics, Preventive Medicine and Public Health, Toxicology, Legal and Forensic Medicine and Parasitology, Pharmacy Faculty, University of La Laguna, 38200 San Cristóbal de La Laguna, Spain; atorre@ull.edu.es (A.H.d.l.T.); crubio@ull.edu.es (C.R.A.)

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**Abstract:** The development and consumption of genetically modified (GM) crops are surrounded by controversy. According to proponents, only molecular biology approaches and genetic engineering tools are realistic food shortage solutions for the world's ever-growing population. The main purpose of this study is to review the impact of GM products on human, animal, and environmental health. People still reject GM crops not only because of safety concerns, but also for moral reasons. Toxicity, allergies, and possible horizontal gene transfer (HGT) to the environment or to other species have been associated with the marketing of GM products. Moreover, the scarce data available about the long-term implications of using GM crops is another opponent concern. Nevertheless, science has evidenced no harm from GM crops use to date but has, instead, reported several benefits that result from their commercialization, such as economic, environmental, and health benefits for the general public. Legislation and policies about GM product labeling standards are being discussed. To overcome emerging food security challenges, considering quality scientific information is essential rather than leaving the issue and merely moving toward moral discussion. Hence, a risk-benefit analysis is necessary.



**Citation:** Vega Rodríguez, A.; Rodríguez-Oramas, C.; Sanjuán Velázquez, E.; Hardisson de la Torre, A.; Rubio Armendáriz, C.; Carrascosa Iruzubieta, C. Myths and Realities about Genetically Modified Food: A Risk-Benefit Analysis. *Appl. Sci.* **2022**, *12*, 2861. <https://doi.org/10.3390/>



## E.O Wilson on synthetic biology & GMOs

Its potential benefits, easily visualized as spreading through medicine and agriculture, are limited only by imagination

It will bring to center stage the microbe-based increase of food and energy

Each GMO technology needs to be carefully monitored, one at a time. And where they pose no great problem, we should go ahead with them, because in general the benefits vastly outweigh the risk

I did a study of GMOS about 15-20 years ago when the conflict first began, and I could find very little reason to suppose that they were a menace to people or environment that they were thought to be



Food and Energy Security Open Access

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Genetically engineered bananas resistant to Xanthomonas wilt disease and nematodes

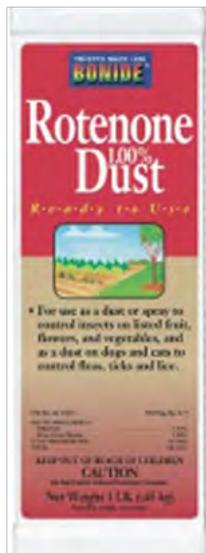
Leena Tripathi Howard Atkinson, Hugh Roderick, Jerome Kubiriba, Jaiindra N. Tripathi

First published: 29 March 2017 | <https://doi.org/10.1002/fes3.101> | Citations: 19

Many GMO researchers work on 3rd world needs

<https://allianceforscience.cornell.edu/blog/2017/04/gmo-banana-offers-hope-for-disease-and-pest-resistance/>

# All pesticides have risks!



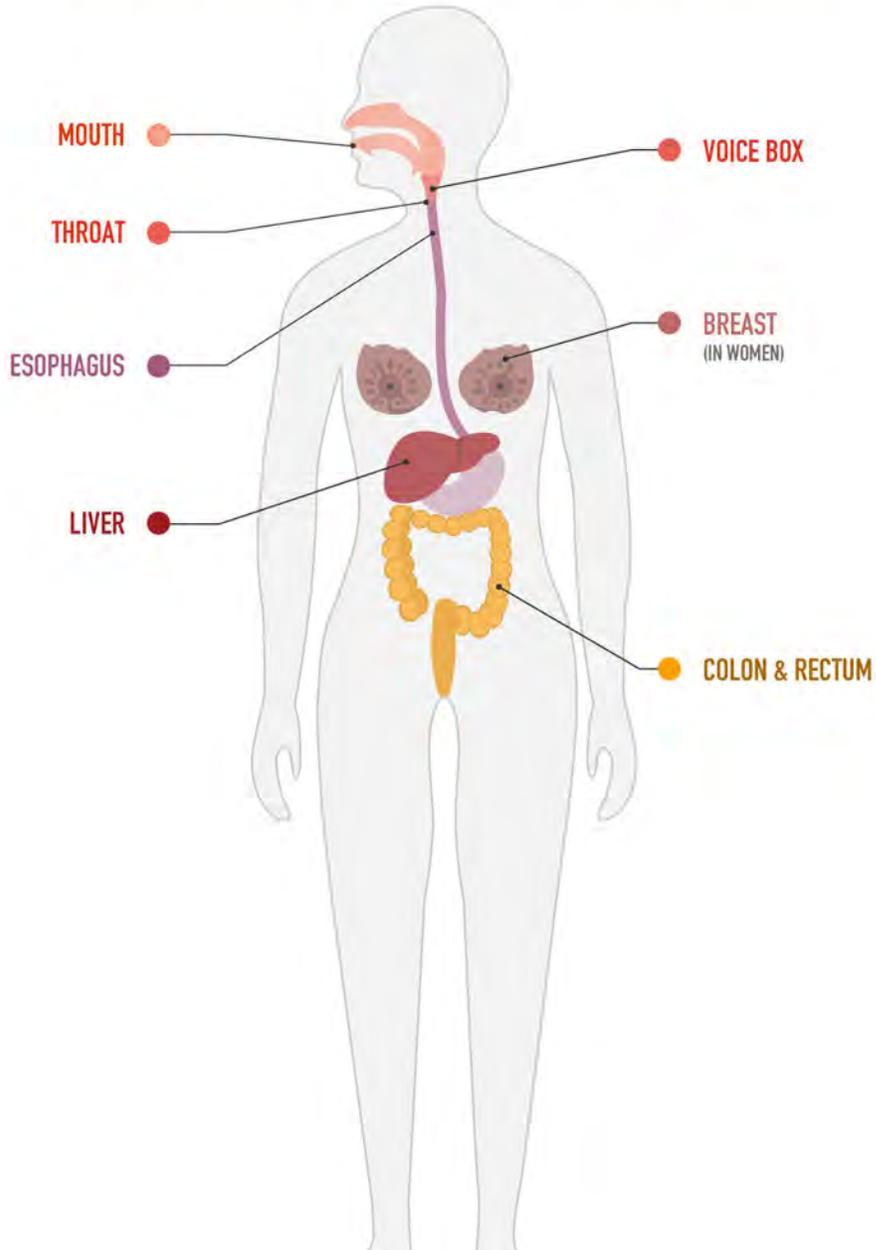
Organic  $\neq$  Safe

Synthetic  $\neq$  Highly toxic

Natural  $\neq$  Safe

No endorsement intended or implied

## Cancers Associated with Drinking Alcohol



Clear patterns have emerged between alcohol consumption and the development of cancers

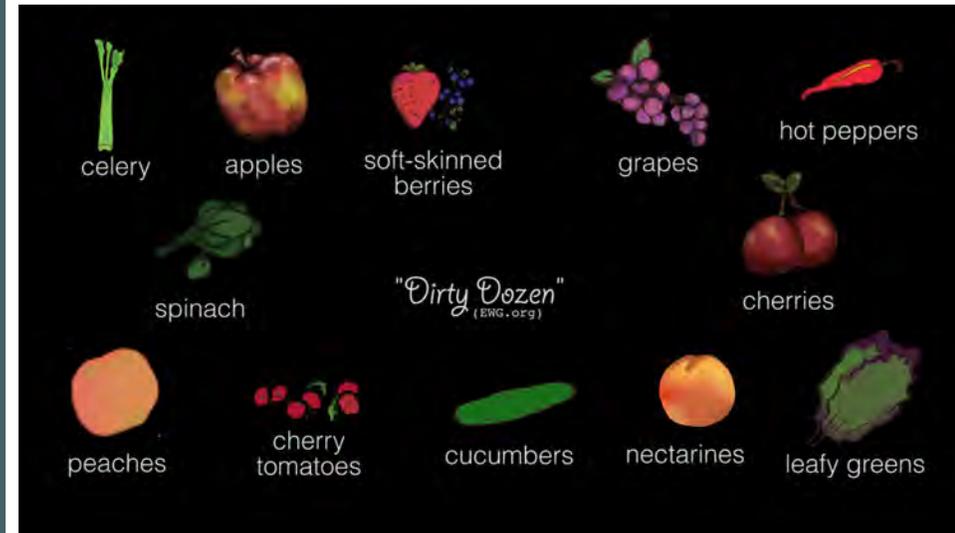
- Increased risk can be as much as:
  - 1 drink a day can be 1.3-fold higher\*
  - 2 -3 drinks per day can be 1.8-fold higher\*
  - >3 drinks per day can be 2-fold higher \*

\*cancer.gov

# Are the “Dirty Dozen” actually “dirty”?

PDP commodity sampling is based on a rigorous statistical design that ensures the data are reliable for use in exposure assessments and can be used to draw various conclusions about the Nation’s food supply

In 2020, over 99 percent of the samples tested had residues below the tolerances established by the EPA with 30 percent having no detectable residue



USDA Agricultural Marketing Service  
U.S. DEPARTMENT OF AGRICULTURE

## Pesticide Data Program

Annual Summary, Calendar Year 2020



Visit the program website at: [www.ams.usda.gov/pdp](http://www.ams.usda.gov/pdp)  
January 2022

Conventional Produce		
Cucumbers	99.99% Non-detect	99.99976% Below tolerance
Cherries	99.98% Non-detect	99.99984% Below tolerance
Strawberries	99.98% Non-detect	99.99987% Below tolerance
Lettuce	99.99% Non-detect	99.99997% Below tolerance
Apples	99.98% Non-detect	100.0000% Below tolerance
Spinach	99.96% Non-detect	99.99988% Below tolerance

# 2016 USDA Pesticide Data Program

**Is that dirty?**

## Biological controls may save our ash

Is it safe to release wasps since they are non-native insects?

Before the wasps were released, research in China and in the United States revealed that the wasps prefer EAB over other insects

No adverse effects were found or raised through the environmental assessment process



*SPATHIUS GALINAE*



*SPATHIUS AGRILI*



*OBIUS AGRILI*



*TETRASTICHUS PLANIPENNISI*

You can read the documents and public comments by visiting  
<https://www.regulations.gov/docket?D=APHIS2014-0094>

permaculture  
organic  
conventional  
sustainable  
ipm  
regenerative



# Need more than coexistence

[usda.gov/topics/farming/coexistence](https://usda.gov/topics/farming/coexistence)