Winning Public and Political Support to Advances in Science Technology Innovation (STI) in the Age of Alternative Facts

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Here’s what I do:

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Here’s what I do:

Department Chair to 57 faculty in 7 locations

Integrate with County Agents

Department Specialties-
Teaching-Research-Extension

Plant breeding
Postharvest technology
Space biology
Cell and molecular biology
Organic crop production
Horticultural crop production
Biochemistry
Crop plant physiology
Farm to schools

Legend

- Research and Education Centers
  Research and Demonstration Sites
- County Extension Offices
- 4-H Camps

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People are seeking honest answers about science, medicine, food and farming and don’t know who to trust.

When they don’t know who/what to trust, they make precautionary decisions.
Groups opposed to biotechnology are very good at building trust.

They use ‘alternative facts’ by confirming the fears/biases of the people unsure of who to trust.

They have outstanding networks.
The Collateral Effects Stall
Application of Innovative Products or Practices
How do we build trust as scientists and ag producers?

Educate them!
Show them the data!
Provide citations!
Teach the facts!
Facts do not matter without trust.

I've learned that people will forget what you said, people will forget what you did, but people will never forget how you made them feel.”

- Maya Angelou
Solution

Our agricultural producers, scientists, ag industry, must be part of the conversation.

Stop talking to each other - and talk to non-traditional audiences.
Not so simple

Scientists, industry professionals, agricultural producers, etc.

Are not trained to do this
Don’t want to do this
Make mistakes when they do this
Not so simple

There are two major barriers blocking good communication:

*How humans process information*
*We trust people that are like us*
How we process information

System 1 – Emotional, irrational, reactive

System 2 – Logical, strategic, calculating
We Trust People Like Us

We group with others of similar worldview and interests.

They adopt and defend similar premises, even if incorrect.

Use groups as identity to anchor deeply held beliefs

We create trusted groups
To Establish Trust You Have to Override the Reactive Brain and Build Trust

Establish that you are not a threat

Listening, showing empathy
Affirming shared values and dreams

Building rapport
How do we win the trust of someone that is emotional and irrational?
Active Listening

Intellectual Charity

Provide a sense of fairness and control of the conversation
Lead With Your Ethics.
What are our mutual concerns?
Communication starts with trust:

Listening, empathy

Establishing a state of shared values and shared risk
HOW DO YOU PARTICIPATE?

ON APRIL 22, 2017
WE MARCHED.
NOW, WE ACT.
CHECK OUT THE WEEK OF ACTION

#MARCHFORSCIENCE
Write something and share with 1000 people

Share something you like with 1000 people
The Power of Amplification and Networks

Pre-Internet

Expert

Now

Expert

10 k contacts
The Power of Amplification via Networks
Reach Out Beyond Our Traditional Audiences

How do we stop just talking to each other and reach others that want to know what we do?
The Opinionated Cook

GMOs, Safety, and Lost Opportunities
by Kevin M. Folla

In the 1980s scientists moved one gene between very different organisms. The gene was the human gene for insulin and it was moved into bacteria so they would produce 100% human insulin for medical applications. This was a good example of what scientists call a "transgenic," the scientifically precise term for "GMO," which seems to mean something different to different people.

In the 1990s plants were engineered with a single trait transferred from a bacterium to a plant. One example comes from a pesticide used for organic produce production. The pesticide is a bacterium that produces a compound that is toxic to caterpillars. The gene encoding the anti-caterpillar compound was cut-and-pasted from the bacterium into the plant, allowing the plant to manufacture its own insect protection. The result was that the need for insecticide application on corn and cotton was cut by much more than half.

Many were wary that a compound that harms caterpillars was in their food, and that's understandable at first. However, we need to remember that plants produce many compounds targeted at insect pests, mostly because they have to defend themselves from pest pressures. The anti-caterpillar compound here is a protein that selectively targets a mechanism only in caterpillars. It does not work on most other insects and certainly is safe on birds and mammals, including humans. In us, the protein is broken down just like the other 40,000 plant proteins we consume.

To the caterpillar it's poison, to humans it is a nutrition—in the same way that chocolate, grapes, and raisins are toxic for a dog but not harmful to people.

This example is just one of the genetic innovations that allow farmers to grow food more affordably with less insecticide, fuel and labor. These technologies have been safely used for over eighteen years without a single case of a health problem ever reported.

So why do people say it is so dangerous? There is always a minority resistance to new technology. Some folks just don't want change, others see an opportunity to capitalize politically or financially from manufacturing fear. Today you'll see authors, TV doctors, and highly-paid seminar speakers propagating and profiting from a message condemning transgenic crops. But this sentiment runs counter to the scientific consensus of the world's independent scientists and our most recognized organizations. The words of fear on websites and Internet memes have a damaging effect on public perception.

Sadly, the difference between the science and public perception shows the release of new transgenic technologies that could be extremely helpful. In the United States, new technologies exist that could help our farmers grow food with less fertilizer and water. Vitamin A, iron, or folate-enriched crops would save countless lives in the developing world. Fruit crops not requiring fungicides would be of great value to the environment. Other genetic modifications help provide consumers with higher-quality produce that lasts longer, meaning less waste.

These solutions exist now, languishing on shelves or stuck in endless, expensive deregulation, or abandoned because of fear from public backlash.

As a scientist, my job is to solve problems, and there are thousands just like me working on new innovations for agriculture. Our biggest frustration is that we've done a good job; we've created new technology that can remedy major problems we all care about. Unfortunately, the schism between what the science says and what the public believes keeps the best technologies from those who truly need them.
Received several email inquiries with specific questions.

Physicians are Critical Conduits for GMO Information

By Kevin Follis, Ph.D., and Karen Cyphers, Ph.D.

Beyond the day-to-day treatment of age-old maladies, today’s physician is plagued with the task of interpreting and debunking issues spawned from the ubiquitous clinic of Dr. Google.

Patients have access to information like never before, and a lot of the worst information comes from slick, deceiving websites with a hard medical facade. These venues fortify the rumors overheard in yoga class, the fears posted on the community board at Whole Foods, and the claims of unscrupulous predators creating a pseudo-medical problem — and then peddling a promised cure.

One of today’s hottest topics is the discussion on foods derived from transgenic crops, commonly referred to as “Genetically Modified Organisms” or “GMOs.” The science is remarkably clear and includes the technologies used to produce human insulin, hormones or antisense recombinant DNA techniques on the market for ill health.

However, just punching in a search term can launch a trek into non-experts, all proclaiming infertility, and dozens of if not hundreds of websites. With tactics nearly identical to vaccines in promoting blanket safety also impred in politics.

This rift between scientists and misinformation maligns corn of food. The reality is that GMO foods are safe, abundant and Americans’ ample waistbands, pressure scripts written. Yet patients convinced they are the food that actually sustained them.

Surprisingly, there are only a handful of lab-installed gene beets. Most of these products are renewable fuels. Their production is found in about 70 percent of GMO crops grown, such as animal feed. There is a tiny amount of papayas, and the latter in certain collapse.

continued on page 44
Get ready for gene editing

By Kevin M. Fatta

The technologies of genetic engineering have not been widely adopted for horticultural crops. In fact, outside of Hawaiian papaya and a small acreage of squash, there is no commercial acreage of genetically engineered fruits and vegetables in the United States. There are many reasons for this, including the high cost of deregulation and the poor societal perception of the technology that makes each approach unattractive for specialty crop industries. These technologies are confined to use in large-acreage crops — at least for the time being.

Scientists are disappointed by the slow adoption. There are many opportunities to improve plant plant yield, quality, and survival during weather extremes, frost resistance to disease and produce dozens of other demonstrated benefits. These solutions have existed in laboratories and greenhouses for decades, but have yet to reach the field.

However, this is about to change in a big way. The next wave of genetic modification is called gene editing, and you will see huge impacts of this technology in crop plants — as well as in animals and human medicine. It is critically important that everyone in agriculture becomes rapidly conversant in this technology, as it already has been a game changer.

Going forward, this technology could have major impacts in fruits and vegetables. However, if the public does not understand it, and if the public does not understand the public perception of these revolutionary technologies may be slow to reach the farm and the dinner plate.

GENETIC ENGINEERING VS. GENE EDITING

How is gene editing different from standard genetic engineering? Think of a plant’s DNA code as a library of books. Each “book” contains the recipe for a specific structure or function within the cell, and together the library of instructions controls the way a plant grows and develops.

By analogy, the implemented genetic-engineering practices add new books to the library, but they are not necessarily books that traditionally belong there. New information is added, and the plants take on new traits. This is how plants can be made to withstand insects or herbicides — the new information added provides them a strategy to survive.

Unfortunately, the process is considered invasive by some, and certainly the public looks at it with suspicion. While science shows these techniques and products to be safe, the high cost of deregulation and lingering public concern temper enthusiasm to improve fruits and vegetables with standard genetic-engineering techniques.

But the process of gene editing is fundamentally different. Think about those books in the library again. Gene editing is a process where a few words in one book in that library can be changed with great precision, affecting the information, and the structure and behavior of the plant. The big difference is that researchers decide which books, which sentence and which words to change. It is that precise.

HOW THE TECHNOLOGY BENEFITS AGRICULTURE

Technically, the process is called CRISPR, standing for “clustered regularly interspaced short palindromic repeats.” Yes, that makes little sense to the casual consumer. What the acronym means is not important, but it is critical to understand what this technology can do.

Just about all of the variability we see in nature or on the farm comes from differences in gene sequence. The differences in DNA are reflected in differences in traits. Traditional plant breeding relies on moving many favorable traits into a single genetic background by crossing them. In the past, there was no way to control the traits or DNA sequence. Plant breeders just used the variation that happened naturally due to evolution or random mutations from natural forces.

Today, scientists can use CRISPR gene editing to construct the changes in genes that affect traits of interest. There are many great examples of how this technology has been used already. Scientists can create the variation that they used to have to look for. In other words, rather than looking for the needle in the haystack, scientists place the needle exactly where it matters and where they can find it.

In plants, it will be possible to edit disease susceptibility genes, making new varieties disease-free. It will be common to edit genes to make plants flower more abundantly (like in roses or fruit crops), or in some cases not flower at all (like in basil or lettuce). There are limitless examples of traits that can be adjusted.

In animals, the technology has been used to eliminate the gene that leads to horn production in cattle. Two calves were born last year that normally wouldn’t grow horns. Thanks to gene editing, they don’t which means they will not have to be dehorned manually. This saves money in cattle production, and the animal does not have to endure the polling process.

African swine fever virus is a major problem in Europe. Scientists in Scotland have created pigs that should not get sick because a gene required for viral infection has been removed with gene editing. This technology could have tremendous implications for animal welfare and farmer profits.

The most important message is that CRISPR-mediated gene editing will be a powerful tool for plant scientists and breeders to improve traits with great precision. It creates the changes seen with traditional breeding in a targeted way, but leaves none of the assembly sequences that mar the perception of conventional genetic-engineering techniques.

SPREAD THE POSITIVE MESSAGE

It is critical that those close to agriculture and related industries understand what this technology can do and communicate it clearly to the public. Participate in discussions, talk to friends, and actively learn of the good things we can do with this revolutionary technology. If these technologies are delayed by misconceptions, we will lose many opportunities to bring improved varieties to the field, and better fruits and vegetables for consumers.

Kevin M. Fatta is a professor and chair of the Horticultural Sciences Department at the University of Florida in Gainesville.
PART 1: Can Bananas Make You Bleed to Death? Will BHT in Kids Cereal Cause Cancer? What is Chemophobia?

By Kevin M. Foltz May 18, 2015  2 Comments

The Food Babe once said that if your food contains an ingredient your third grader can’t pronounce you shouldn’t eat it. I say that in that case no one would ever eat an organic banana, which contains the naturally occurring, yet difficult to pronounce phylloquinone, tocopherol and palmitoleic acid. These chemicals are tongue twisters for sure but naturally occurring, harmless and good for you chemicals that nature put in your sun-ripened banana.

We all share concern about the safety of food and food additives. Scary-sounding chemical names create suspicion and fear, and with our endless exposure to information everyone seems to be an expert in deciphering just how dangerous chemicals really are. In fact, a thriving industry that capitalizes on fear of chemicals has cropped up, and of course they profit from selling supplements and organic food that are supposed to be chemical free (spoiler alert, everything is made up of chemicals). We call this scare tactic chemophobia.

Often, this chemophobic industry focuses on food additives – chemicals that impart important properties to food nutrition, stability, or quality – as chemicals to be afraid of. As a professor of horticultural sciences I can tell you food additives are chosen because they are safe for human consumption in the quantities used.
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Amplify messages from trusted experts.

Jennie Schmidt

Brian Scott

Sarah Schultz
We Go Forward Together

Facts don’t matter until you’ve earned their trust

Effective communication starts only after listening, establishing rapport

Scientists / academics are good at talking to each other. Reach out to new groups, build trust and share expertise.

Generate content, amplify work of others

Develop and expand audience-
Become the trusted source

Handle criticism with class

Defend science, farmers and scientists.
“Don’t tell me it can’t be done, tell me what needs to be done and help me do it. “ - Dr. Norman Borlaug

Thank you.

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