

CELEBRATING  
50 YEARS  
AS THE  
TRUSTED  
SOURCE FOR  
AGRICULTURAL  
SCIENCE AND  
TECHNOLOGY

# CELEBRATING 50 YEARS OF CAST



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Council for Agricultural Science and Technology. 2021.

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*CAST's 50 years of accomplishments would not have been possible without the combined efforts of our members, supporters, staff, and volunteer authors and reviewers. Time and time again, the organization has demonstrated its ability to overcome challenges—such as the COVID-19 pandemic this past year—and emerge stronger and better prepared to face the future. We have been fortunate to have leaders who have helped us stay focused on the CAST mission, vision, and the work of communicating science to key stakeholders.*

— David D. Baltensperger  
CAST President, 2020-2021

A 50th anniversary marks a significant milestone for an organization. The Council for Agricultural Science and Technology's (CAST) boards and staff are excited to announce its 50th in 2022, and we are celebrating the occasion throughout the next year. One of the activities is the creation of this commemorative publication, with the goals of 1) recalling and celebrating our accomplishments, 2) evaluating our current standing, and 3) offering some unique perspectives on CAST's future direction.

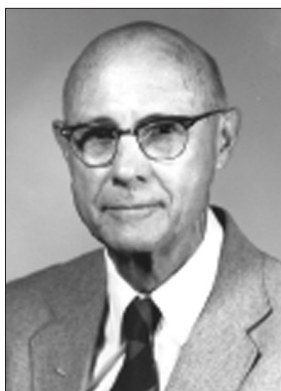
We are grateful to all of our leaders over the past 50 years who have defined, and continue to refine, the mission and vision of CAST. That legacy of leadership—with its continuous influx of new and revitalized ideas and energy around communicating the science, technology, and innovation of food and agriculture—has helped propel us to where we are today.

And of course we appreciate our members, supporters, and volunteer authors and reviewers, whose contributions are literally the lifeblood of this organization. We look forward to working with you all to continue that legacy in a way that keeps CAST viable and relevant, while constantly advancing agriculture to sustainably feed a growing and more demanding world population in the future.

— Kent G. Schescke  
CAST Executive Vice President & CEO, September 2021

The CAST Staff (pictured in 2021)  
Back row, left to right: Megan Wickham, Scientific Editor;  
Gale Osborne, Office Manager and Events Coordinator;  
Kent Schescke, Executive Vice President & CEO;  
Dan Gogerty, Managing Communications Editor  
Front row, left to right: Dylana Luett, Communications and Social  
Media Specialist; Melissa Sly, Director of Council Operations;  
Caryn Dawson, Student Administrative Assistant;  
Colleen Hamilton, Membership Specialist



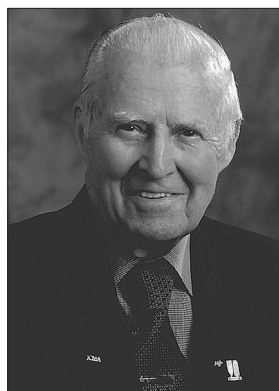


## CHARLES A. BLACK: PRIMARY FOUNDER OF CAST

Charles A. Black is generally recognized as not only the primary founder of CAST, but also its “moving spirit” from its inception in 1972 until he retired from the Board in 1988. Dr. Black’s vision was to get accurate agricultural information from food and agricultural scientists to congressional committees, governmental agencies, and the media. At a 1970 meeting of the Agricultural Board of the National Academy of Sciences–National Research Council, Dr. Black was appointed chairman of a five-member planning committee charged with pursuing the idea of “an independent association of the agricultural science societies.”

CAST was organized in 1972 with Dr. Black as its first president. Under his leadership, CAST grew to include 25 scientific societies and more than 3,500 members. During his tenure as President, and then Executive Vice President, CAST published close to 100 major reports, including reports on dietary goals of U.S. citizens, antibiotics in animal feed, the effects of regulation on the development of agricultural chemicals, water and energy use in agriculture, and principles of carcinogenicity in foods.

Until his death in 2002, Dr. Black was a lifelong advocate of the role of science in public policy decision making. In his honor, CAST established the Charles A. Black Award in 1986. Dr. Black was the first recipient of this award, which was presented annually for 23 years.



## NORMAN E. BORLAUG: A CAST ADVOCATE FOR MANY YEARS

Dr. Norman E. Borlaug, one of only five people in history to be awarded the Nobel Peace Prize, the Presidential Medal of Freedom, **and** the Congressional Gold Medal, was a promoter of CAST since its founding in 1972. His remarks on behalf of CAST at the initial CAST–Industry meeting in 1973 later appeared as CAST’s first published paper, and articles on Dr. Borlaug’s life and work have appeared in several CAST publications through the years.

Dr. Borlaug received CAST’s first “Distinguished Achievement Award in Food and Agricultural Science” as part of CAST’s 10-year anniversary. On that same occasion, a tree was planted in his honor on the ISU campus, where it continues to grow and mature. In 1998 as part of an American Crop Protection Association’s Annual Meeting (now CropLife America), CAST presented a special trophy to Dr. Borlaug commending him for his scientific and humanitarian contributions to reduce the extent of hunger and starvation.

In April 2005, CAST presented the Charles A. Black Award to Dr. Borlaug for his outstanding achievements as a scientist, educator, and communicator. Dr. Borlaug participated in an Open Forum with other guest speakers and later made a presentation to CAST Board Members and guests during which he voiced his continued support for the work CAST is doing.



CAST Board of Directors Meeting, Bettendorf, Iowa (1973).



CAST’s second Food Day Dialogue (1976).

### CAST TIMELINE

1973 – First Board of Directors Meeting is attended by ten member societies.

1977 – A CAST television news film clip based on a Task Force Report is sent to 150 TV stations in metropolitan markets.

1979 – An enlarging CAST Office relocates on the Iowa State University campus.

## 1972

1972 – The Council for Agricultural Science and Technology (CAST) is chartered as a nonprofit organization located in Ames, Iowa.

1975 – During “Food Day Dial-ogues” CAST scientists answer telephone calls from U.S. students on subjects of food and the environment.

1978 – Membership grows to 25 food and agricultural science societies.

- CAST hosts its first Congressional Breakfast for members and staffs of the Senate and House Agriculture Committees, the subcommittees on Agricultural Appropriations, and the Office of Technology Assessment (1980).



CAST hosts a Congressional Breakfast in Washington, D.C. (1980).

### CAST's 10-YEAR ANNIVERSARY, 1982

- The Board meets in Ames, Iowa, to celebrate CAST's 10th Anniversary with special events and guest speakers.
- Dr. Norman Borlaug is the guest speaker at the banquet, addressing CAST members and guests on "The Place of Science in the Policymaking Process."



Dr. Borlaug rests on the marker in front of the scarlet oak tree dedicated in his honor on the Iowa State University campus (1982).

- A summary of CAST activities during the first ten years, with photos and bios of CAST Presidents, is published in the May 1982 issue of *NEWS from CAST*.
- The first issue of *Science of Food and Agriculture* is printed and distributed to 12,000 high school science department heads nationwide; the magazine is funded by special grants for a three-year period (1983).
- The Board of Directors authorizes the staff to computerize the CAST office and to move ahead with a survey of congressional members and staff regarding CAST publications (1984).
- News releases on two subjects—bovine somatotropin and President Bush's food safety plan—are written and submitted to Congress, the news media, and other selected groups (1989).

- CAST moves to its newly remodeled building in Ames, Iowa (1993).



CAST officers at the ribbon-cutting ceremony for CAST's new building (1993).

- The first issue of *CAST Digest* is published (1995).
- In a move to keep up with technology, CAST launches its first website (1995).
- Three new societies join CAST; with 36 member societies, CAST represents the broadest range of professional organizations in its history (1997).
- By accepting a CAST challenge, 247 members upgrade their membership to the Century Club level (1997).

### CAST's 25-YEAR ANNIVERSARY, 1997

- In May, 1997, the Iowa State University Department of Agriculture hosts a reception for CAST in recognition of the 25th anniversary. CAST members from across Iowa, ISU faculty and students, and CAST staff attend a formal outdoor reception.



Former CAST EVP Richard Stuckey (second from left) with CAST officers and guests at the 25th Anniversary reception (1997).

- CAST sponsors a major international food conference, "Food Safety, Sufficiency, and Security: Domestic and International Dimensions." The conference includes a special anniversary banquet.
- CAST produces a commemorative 25th Anniversary publication that features comments from many past presidents.

1981 – The May Issue of *NEWS from CAST* publishes the names of 4,484 individual members.

1984 – The Washington representative position (previously a volunteer appointment) becomes a part-time staff function.

1988 – CAST moderates a panel for a USDA regional conference on "Agricultural Biotechnology and the Public."

## 1980

1980 – CAST establishes a network of individual members who serve as State Liaison Representatives.

1982 – CAST presents a Distinguished Achievement Award in Food and Agricultural Science to Norman Borlaug.

1986 – CAST establishes the Charles A. Black Award to recognize exemplary contributions to public understanding of food and agricultural science.

- CAST establishes a Food and Agricultural Biotechnology Program and hosts a symposium on "Agricultural Biotechnology in the Global Market Place" (2000).
- With Board approval, CAST opens an office in Washington, D.C., and maintains the Ames office (2001).
- A new series, "Success Stories in Agriculture," is added to the publication output, and collections of older publications are offered on CDs (2004).

### CAST's 35-YEAR ANNIVERSARY, 2007

- CAST observes its 35th anniversary with a celebratory meeting in Ames, touring several Iowa State University labs, and hosting a reception for numerous guests.
- Many Board members visit the CAST office and meet with staff members.
- Executive Vice President John Bonner and former EVP Richard Stuckey burn the mortgage for the Ames location.



- A ClustrMap is added to the website to track the frequency of online visits according to global location (2008).
- The first Borlaug CAST Communication Award is presented (2010).
- Building on a major restructuring initiative that began in 2009, the CAST organization completes the "ReCAST of CAST." A Board of Trustees is established to function along with the Board of Representatives and the Board of Directors (2010).



### CAST's 40-YEAR ANNIVERSARY, 2012

- The theme for this anniversary acknowledges both what lies behind and what lies ahead for this organization: Remembering Our Past — Ensuring Our Future.



- CAST staff prepares a 40th anniversary booklet filled with highlights of CAST history, activities, publications, and notable people.
- Former administrators, officers, and CAST members are guests at a "CAST Reunion," where they share experiences and browse through extensive photo collections.
- An evening reception is held at the Iowa State Historical Building in Des Moines.

- Iowa Secretary of Agriculture Bill Northey, who also heads the National Association of State Departments of Agriculture, makes a video endorsing CAST as a valuable resource for information on agricultural issues (2012).
- CAST editors develop 1-page summaries of new publications; after approval by the task force chairpersons, these *Ag quickCASTs* are distributed electronically (2013).
- CAST creates a Strategic Planning Committee chaired by the president-elect with two representatives from each work group. The committee defines three major initiatives as core areas of focus. Extensive planning work results in the 2016–2020 Strategic Plan (2015).
- In 2019, CAST registers nearly 10k followers across its social media accounts (2019).

### CAST EXECUTIVE VICE PRESIDENTS

1974	Charles A. Black
1985	William W. Marion
1989	Kayleen A. Niyo, as Interim EVP
1990	Stanley P. Wilson
1992	Richard E. Stuckey
2001	Teresa A. Gruber
2005	Richard E. Stuckey, as Interim Advisor
2005	John M. Bonner
2013	Linda M. Chimenti
2015	Kent G. Schescke

1993 – The Board approves the purchase and renovation of an office building in Ames, Iowa.

1997 – CAST sponsors a major international conference on "Food Safety, Sufficiency, and Security."

1999 – The U.S. House Agriculture Committee requests a complete library of CAST publications.

1990

1991 – Four new work groups are established within the Board of Directors.

1993 – A new series of publications, called Issue Papers, is approved and the first paper is published.

1997 – To celebrate its 25th anniversary, CAST produces a commemorative publication, *Charting the Course to Science-Based Public Policy*.

## PARTNERSHIPS AND ROLLOUT PRESENTATIONS

From its inception, CAST has partnered with many outstanding organizations, both governmental and private, to communicate science-based information. Selected highlights include:

- Work with the Institute for Conservation Leadership on a joint program, “Conversations on Change.”
- An agreement with the U.S. Trade and Development Agency to coordinate a U.S.–China food and agricultural biotechnology program and dialogue.
- Co-sponsorship with USDA-APHIS of a “Biotechnology-derived, Perennial Turf and Forage Grasses” symposium.
- Collaboration with the American Bar Association’s Section of Natural Resources, Energy, and Environmental Law to convene a series of roundtables.

Because communication is a vital part of its mission, CAST coordinates the rollouts of its new publications with many stakeholders, both in Washington, D.C., and around the country. These events can take the form of an in-person presentation by the task force chair or author, a panel discussion focused on the topic, or a video available through the CAST website. Each rollout is accompanied by a media release and notices to all CAST members.



CAST has nurtured connections with universities from its inception, and during the past twenty years, the organization has developed an Education Program that provides information and direct involvement for members. Participating schools receive CAST resources and publications. They also have access to current news through social media, blog entries, videos, and the *Friday Notes* newsletter.

The CAST Education Program now provides resources to faculty and students at 18 influential universities and to many secondary students through the National

Association of Agricultural Educators. In 2016, the CAST Board gave universities the opportunity to participate directly through a representative who serves on a CAST work group. Universities also share their information about science, agriculture, and student activities through CAST’s communication formats. The Education Program is a two-way street—it benefits members, and it helps CAST achieve its mission.

## CAST SCIENCE COMMUNICATION SCHOLARSHIP

In 2018, the CAST Science Communication Scholarship started with the goal of involving young professionals with the annual meeting. Graduate students submit a 90-second video, podcast, or infographic to convey an exciting component of their research; judges provide feedback to help strengthen their science communication strategy. Selected students are invited to the CAST Annual Meeting—held at different member universities each year—to network with like-minded scientists from across the nation, as well as participate in the sessions focused around trends in agriculture and communicating important ag-related issues. These students receive a stipend as part of the scholarship and have their work displayed on CAST’s social media pages.



The 2019 CAST Science Communication Scholarship recipients with President Gabe Middleton, 2018 BCCA recipient Dr. Marty Matlock, and EVP Kent Schescke.

## TAKING CAST’S MESSAGE TO WASHINGTON



CAST’s leadership has always understood the importance of having a presence in Washington, D.C., and various methods have been used to accomplish that goal. Shortly after CAST was founded, the board created a volunteer appointment as Washington Representative. Later, that position became a part-time staff function.

In the late 1990’s, CAST hired Meyers & Associates, a government relations/business consulting firm, and for several years in the early 2000’s, CAST established and staffed a D.C. office. But throughout its history, CAST has relied on personal visits by the Executive Vice President, board leaders, task force participants, and individual members to keep government officials and agency directors aware of what this organization has to offer.

2002 – In cooperation with the U.S. Trade and Development Agency, CAST coordinates a U.S.–China ag dialogue.

2009 – With the introduction of CAST videos on YouTube, a presence on Twitter, and a blog, CAST joins the world of social media.

2010 – CAST inaugurates the Borlaug CAST Communication Award, which incorporates the former Charles A. Black Award.

# 2000

2000 – A new Biotechnology Outreach Program enhances public understanding of ag and food issues.

2005 – CAST begins translations of some of its publications into Spanish and other languages.

2010 – As part of a major organizational restructuring, CAST forms a Board of Trustees to serve along with its Board of Directors and Board of Representatives.



## CAST AWARDS

In 1986, the CAST Board established an award to recognize exemplary contributions to public understanding of food and agricultural science. Named the Charles A. Black Award, this honor was presented annually for twenty-three years. In 2010, the award was expanded in scope and renamed the

Borlaug CAST Communication Award, dedicated to Dr. Norman Borlaug and Dr. Charles A. Black. These two men embodied the passion and dedication to agricultural research and technology that the award was designed to recognize.

The presentation gift, a bronze statue created especially for CAST by noted sculptor Jerry Palen, carries out the theme of "A World Supported by Plants and Animals."

Since 2010, CAST has announced the selection through a news release at an annual spring event. The presentations have been made in the fall during the prestigious World Food Prize gathering in Des Moines, Iowa, often paired with a panel discussion arranged by CAST and featuring the winner.

### CHARLES A. BLACK AWARD WINNERS

**1986—Charles A. Black**, Council for Agricultural Science and Technology

**1987—William E. Larson**, University of Minnesota

**1989—Stanley E. Curtis**, University of Illinois, Urbana-Champaign

**1990—Donald E. Davis**, Auburn University

**1991—Homer M. LeBaron**, Ciba-Geigy

**1992—John Pesek**, Iowa State University

**1993—Fergus M. Clydesdale**, University of Massachusetts, Amherst

**1994—F. J. Francis**, University of Massachusetts, Amherst

**1995—Dale E. Bauman**, Cornell University

**1996—Luther G. Tweeten**, The Ohio State University

**1997—Neil E. Harl**, Iowa State University

**1998—Per Pinstrup-Anderson**, International Food Policy Research Institute

**1999—Abner W. Womack**, University of Missouri, Columbia

**2000—Dennis R. Keeney**, Iowa State University

**2001—Judith S. Stern**, University of California, Davis

**2002—Calvin O. Qualset**, University of California, Davis

**2003—Kong Luen Heong**, International Rice Research Institute

**2004—Marjorie A. Hoy**, University of Florida, Gainesville

**2005—Norman E. Borlaug**, Sasakawa Africa Association

**2006—Stanley R. Johnson**, Iowa State University

**2007—David H. Baker**, University of Illinois

**2008—Pedro A. Sanchez**, Columbia University

**2009—Wayne Skaggs**, North Carolina State University



### BORLAUG CAST COMMUNICATION AWARD WINNERS

#### Top row, left to right

**2021—Sarah Evanega**, Cornell University

**2020—Alexa Lamm**, University of Georgia

**2019—Frank Mitloehner**, University of California, Davis

**2018—Marty Matlock**, University of Arkansas

#### Middle row, left to right

**2017—Jayson Lusk**, Purdue University

**2016—Kevin Folta**, University of Florida

**2015—Channapatna Prakash**, Tuskegee University

**2014—Alison Van Eenennaam**, University of California, Davis

#### Bottom row, left to right

**2013—Jeff Simmons**, Elanco Animal Health

**2012—Carl Winter**, University of California, Davis

**2011—Catherine Bertini**, Syracuse University

**2010—Akin Adesina**, President, African Development Bank

### ADDITIONAL CAST HONOREES

CAST intermittently honors people who have demonstrated outstanding support for the organization in one of several ways: by advocacy of CAST's outreach activities, by active membership and fundraising efforts, or by dedicated participation on one of the CAST Boards. Recipients of the President's Award, the Champion Award, and the Distinguished Service Award may be found on the CAST website under the Awards tab.

2016 – The 2016–2020 Strategic Plan becomes a major focus of review and discussion by all boards, work groups, and staff.

2020 – To help contribute to a safe and healthy environment during COVID-19, CAST uses free online webinars rather than face-to-face gatherings to disseminate its new publications.

2022 (Projected) – CAST celebrates its 50th Anniversary and plans for more ways to continue its mission.

## 2011

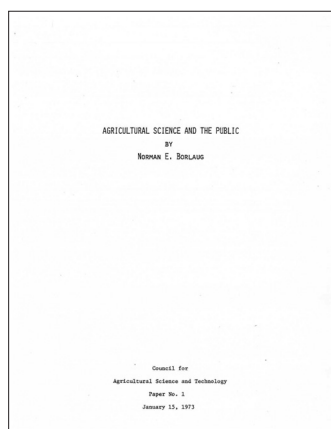
2013 – CAST initiates *Ag quickCASTs*, one-page excerpts from each new publication to meet the demand for "quicker access to information."

2018 – A new program of Science Communication Scholarships provides for selected graduate students to network with ag scientists.

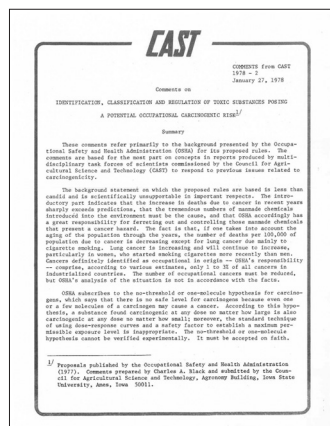
2020 – CAST creates self-study guides based on selected CAST papers; these can be used by teachers, parents, and students.

# CAST COMMUNICATES THROUGH PUBLICATIONS

CAST has built a reputation for producing publications that are a trusted source of information about agricultural science and technology issues. Ranging from CAST Paper No. 1, which presented Norman Borlaug's remarks on behalf of CAST in 1973, to comprehensive Task Force Reports authored by multiple scientists, to more recently the briefer CAST Commentaries and Ag quickCASTs, CAST publications form an impressive collection.



Papers

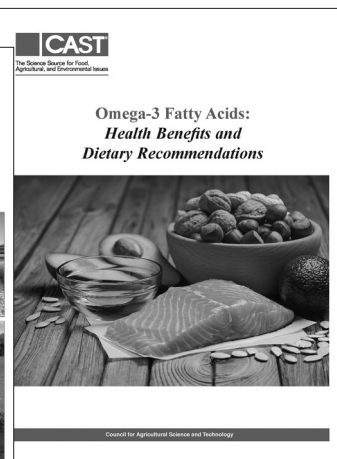
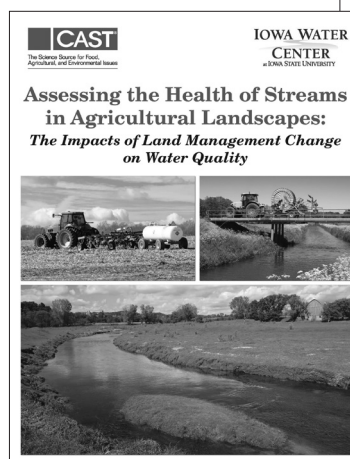


Comments from CAST

## TOP 10 MOST POPULAR CAST PUBLICATIONS

Since its founding, CAST has produced and distributed hundreds of publications. The list below shows the "Top 10" based on impact data from two years after each release. All publications are available to download at [cast-science.org/publications](http://cast-science.org/publications).

1. The Potential Impacts of Mandatory Labeling for Genetically Engineered Food in the United States, April 2014
2. Plant Breeding and Genetics, March 2017
3. The Direct Relationship between Animal Health and Food Safety Outcomes, May 2012
4. Herbicide-resistant Weeds Threaten Soil Conservation Gains: Finding a Balance for Soil and Farm Sustainability, February 2012
5. Assessing the Health of Streams in Agricultural Landscapes: The Impacts of Land Management Change on Water Quality, March 2012
6. Animal Feed vs. Human Food: Challenges and Opportunities in Sustaining Animal Agriculture Toward 2050, September 2013
7. Air Issues Associated with Animal Agriculture: A North American Perspective, May 2011
8. Food, Fuel, and Plant Nutrient Use in the Future, March 2013
9. The Contributions of Pesticides to Pest Management in Meeting the Global Need for Food Production by 2050, November 2014
10. Impact of the Precautionary Principle on Feeding Current and Future Generations, June 2013



Special Publications

### Papers

- January 1973–February 1983
- Speeches and expository statements

### Comments from CAST

- July 1976–February 1994
- Selected letters and official comments

### Special Publications

- November 1972–ongoing
- Proceedings, conference papers

### Task Force Reports

- May 1973–ongoing
- Comprehensive treatment of broad topics

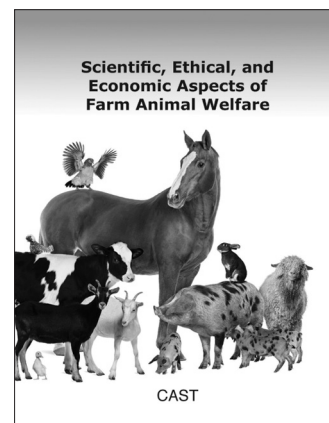
### NewsCAST

(formerly *News from CAST*)

- April 1974–Spring 2006
- A record of CAST activities and publications

### Science of Food and Agriculture

- 1983–1994
- Magazine for high school teachers



Task Force Reports



News from CAST / NewsCAST



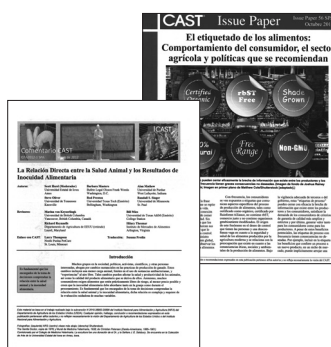
Science of Food and Agriculture



## Issue Papers



## Annual Reports



## Translations

## Issue Papers

- July 1993–ongoing
- Focused treatment of a specific topic

## CAST Commentaries

- December 1993–ongoing
- Timely responses by CAST scientists to current issues

## Ag quickCASTs

- 2013–ongoing
- One-page excerpts produced for each new publication

## Study Guides

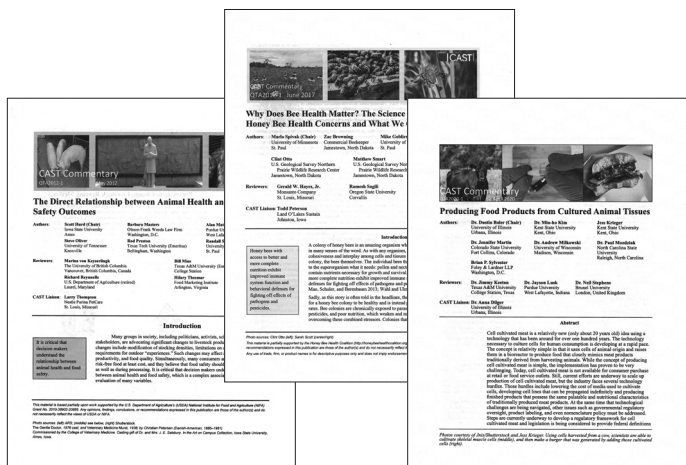
- 2020–ongoing
- Self-study materials based on selected CAST papers

## Annual Reports

- 1979–ongoing
- Yearly report to members and stakeholders

## Translations

- 2005–ongoing
- CAST publications translated into other languages



## Commentaries

## AN AMAZING NUMBER!

CAST publications of all types are written and reviewed by task forces of VOLUNTEER EXPERTS that include scientists from many disciplines as well as economists and legal experts. In 2021, research by CAST staff shows that a total of **3,758** people have served as a CAST Task Force Member!

**Publication Impacts Report**  
The Science Source for Food, Agricultural, and Environmental Issues

CAST Issue Paper 69

**Food Biofortification—Reaping the Benefits of Science to Overcome Hidden Hunger**

Released October 14, 2020

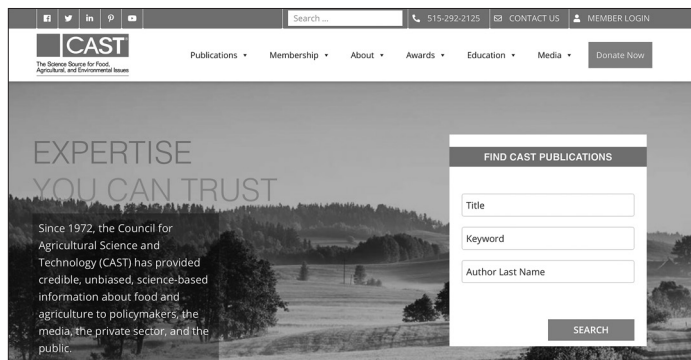
Chair: Dr. Howarth Bouis, International Food Policy Research Institute; 21-member task force

## TRACKING IMPACT DATA

Impact data for each CAST publication are tracked and reported on at 6, 12, 18, and 24 months after the paper releases. Categories currently being tracked include:

- Release/Rollout: summary of the rollout day, presentations, speakers, attendees, etc.
- Press release: contacts and media pickup results
- Comments received: direct email comments sent to authors or staff
- Follow-on activities: additional deliverables such as video, translations, blogs, interviews, and invitations to speak at other events
- Direct and indirect paper distribution: stats on downloads, printed copies distributed, and sites that post the paper
- Articles and web mentions: original articles on the topic with references to the CAST paper
- Paper citations: reports or papers that cite the CAST paper
- Social media: pickups in social media related to the paper
- Impact reports for recently released CAST publications can be found on the CAST website and on each publication web-page.

# MANY SOURCES OF CAST INFORMATION



## CAST WEBSITE

CAST first began distributing information over the internet in the early 1990s; by 1995, more than 100 CAST documents and links to scientific societies and public policy sites were available through an internet host. In 1995–1996, CAST introduced its own website where Task Force Reports, Issue Papers, and information on CAST activities were available to view and download. In 2003, CAST unveiled a newly remodeled homepage, and significant updating and development occurred in 2004, 2006, and 2007. A major upgrade took place early in 2011 that eliminated obsolete programming language that had been used previously.

The newest version of the website, launched in 2019, features these updates:

- Is simpler to navigate and search
- Presents a clean look
- Offers a donation option
- Has password-protected pages and information accessible to members only
- Is easier to manage administratively

## SUMMARY OF ACTIVITIES

Highlights of newsworthy CAST activities, such as new publication releases, announcements of award winners, and joint ventures with other ag organizations, are published two or three times a year. These documents are distributed electronically and can be found on the CAST website under the About tab, Summary of Activities.

### TRANSLATIONS

To reach a wider audience of stakeholders with its information on agricultural issues, CAST selectively has certain publications translated into other languages. Most translations are into Spanish and these can be found on the CAST website under the Publications tab, Translated Publications.



## STUDY GUIDES: HELP FOR TEACHERS AND STUDENTS

From 1983 through 1994 CAST published a magazine titled *Science of Food and Agriculture*. Intended for high school teachers, this publication was distributed to approximately 12,000 U.S. high school science departments.

In 2020, recognizing that many schools nationwide had moved to remote learning due to the COVID-19 pandemic, and that teachers were searching for resource materials to use online, CAST developed a new type of publication—Study Guides. When a new CAST publication is issued, the accompanying student guide includes:

- An Overview
- Learning Outcomes
- Resources
- Assessment Questions
- Student Reflection

These student Study Guides are available by going to the paper's landing page on the CAST website under the Publications tab.



## CAST FRIDAY NOTES

For decades, CAST members have received a weekly newsletter designed to inform them about a wide variety of agriculture, science, and technology issues. From current farm policies to food production innovations, *Friday Notes* enables readers to keep up on current events and updates from the CAST organization. With short narrative segments, visuals, and more than 55 links per issue, the newsletter includes science-based news, highlights of CAST publications, and access to useful resources—as well as a few “off-the-wall” articles and the occasional groaner pun.

A CAST electronic newsletter began in 1996 as a message to leaders of member societies. By 1998, CAST NEWS was an email update sent to members, with the title “Friday Notes” adopted in 2001. Since 2004, the editorial staff in the Ames office has taken responsibility and during the ensuing years, *Friday Notes* has become a valued membership benefit.

In recent years, the newsletter has increased its interaction with members, especially universities in the CAST Education Program. Important ag/science issues are shared with a wide variety of stakeholders in the CAST community. *Friday Notes*, published 48 times a year, is a piece in the dynamic jigsaw puzzle CAST uses to pursue its mission of communicating credible, science-based information.

# SOCIAL MEDIA EXPANSION

Along with producing its numerous publications, CAST recognized the need to begin using social media to expand its reach to an extended and diversified audience. At the close of 2009, CAST developed a social media strategy that was officially rolled out in a February 2010 edition of *Friday Notes*. At that time, CAST used Blogger, Twitter, YouTube, and SchoolTube to supply information regarding new publications, promote upcoming events and awards, and let the public provide feedback on agricultural issues. Additional platforms have been added to keep expanding CAST communication options. Student interns were often of assistance in identifying and setting up useful media sites.



## **Twitter** @CASTagScience

In 2009, CAST created a Twitter account with the username @CASTagScience. With this initial step, CAST began to build recognition among producers, companies, associations, and individuals in the social media spectrum. In 2010, CAST had 700 Twitter followers, and that number has grown to more than 8,400 in 2020.



## **YouTube** youtube.com/CASTagScience

Another early entrance into CAST social media use was the creation of a YouTube channel in 2009. It was used to offer publication webinars, information about annual meetings and award presentations, and agricultural and scientific videos.

## **SchoolTube**

This platform was in use from 2009–2016 to promote CAST's educational videos.

## **Blog** cast-science.org/news

In 2010, CAST began publishing blog posts on Blogger before switching to WordPress. In 2019 the blog merged into the CAST website, making it easier for audiences to see all CAST content in one place. As of 2021, more than 700 blogs have been published, including ones written by staff, guests, and op-ed writers.



## **Facebook** @CASTagScience

CAST created a Facebook account in 2011 and the number of "likes" and followers has grown steadily. Through this popular site, CAST has communicated agricultural and scientific messages to varied audiences. The "CAST Catch of the Day" proved to be a very successful feature.



## **Pinterest** pinterest.com/castagscience

CAST began a Pinterest presence in the spring of 2012 to capture another aspect of social media. Six categories were developed: Ag Humor, Animals, Food and Food Safety, Plants and Gardens, Miscellaneous, and CAST blogs.



## **LinkedIn** linkedin.com/company/castagscience

In 2012, CAST also created a LinkedIn profile on this platform used by many professionals. Scientific news, upcoming publications, and webinars are posted on this site.



## **Videos**

In 2009, CAST contracted with the Capital Media Group to videotape publication rollout presentations for use on the CAST website as well as YouTube and SchoolTube. Typically, the task force chairperson was recorded while giving a talk to a business or governmental audience, often in Washington, D.C. This practice was used successfully for several years to expand the reach of new publications. In addition, Iowa Senator Tom Harkin and Iowa Secretary of Agriculture Bill Northey made videos endorsing CAST as a credible source of agricultural information. These videos may be viewed on the CAST website under the Media tab, Videos.

## **Webinars**

More recently, it has become increasingly practical to have a task force chairperson connect with an audience through a webinar hosted by CAST rather than travel to give an in-person talk. Especially in 2020, due to constraints from the COVID-19 virus, travel was restricted and presentation locations were closed. The webinars were advertised in advance and available to a live audience. Later, the presentation was posted to the CAST website for additional viewing along with a complete listing of task force members. Webinars may be viewed on the CAST website within the description of each publication.

## SOCIAL MEDIA FACTS

In 2020, CAST had more than 12,000 followers across all of its social media accounts:

- Facebook reached 1,787 followers
- Twitter climbed to 8,405 followers
- LinkedIn totaled 508 followers
- YouTube acquired 500 subscribers
- Pinterest attracted 900 followers

## CAST MEMBERSHIP IS A COALITION

Fifty years ago, CAST was founded by an initial group of seven scientific societies. During the ensuing years, the organization has grown and expanded its membership to include nearly two dozen Scientific Societies that play a major role in CAST governance through a delegate on the Board of Representatives.

Other members in the CAST coalition include:

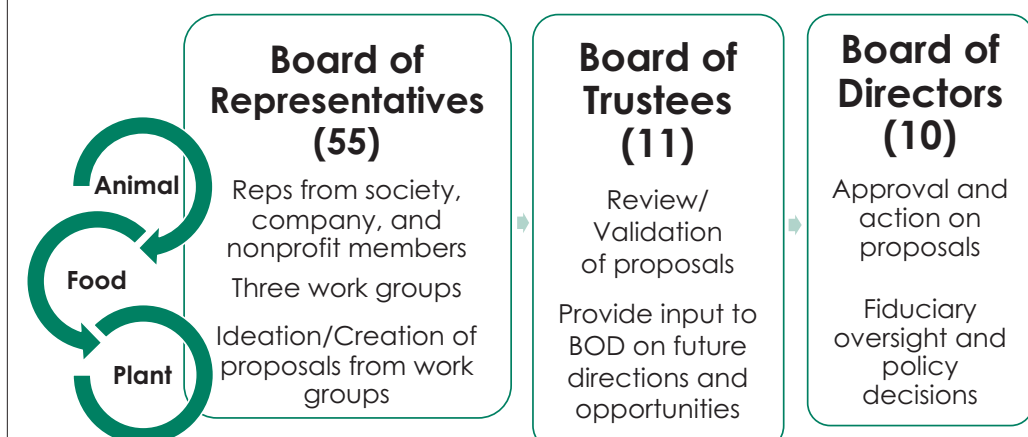
- Associate Societies
- Educational Programs
- Companies and Cooperatives
- Subscribers
- Nonprofit Organizations
- Individual Members

The CAST website, under the Membership tab, provides detailed information for each membership category, including contribution levels, benefits, donation recognition options, and an application form.

One of the most important benefits Individual Members receive is knowing that they support the release of respected CAST publications that are endorsed by the scientific community and depended on by many individuals and families. For Individual Members, the website lists benefits, recognition of support, and contribution levels in several categories. In its efforts to gain more members among younger people interested in agricultural science, CAST offers these special membership categories:

- **Young Professionals:** a reduced-fee membership available to individuals who were enrolled as full-time students (according to their educational institution's policy) at an accredited college or university and have graduated within the past two years.
- **Students:** FREE membership is available to those currently enrolled as a full-time student (according to their educational institution's policy) at an accredited college or university.

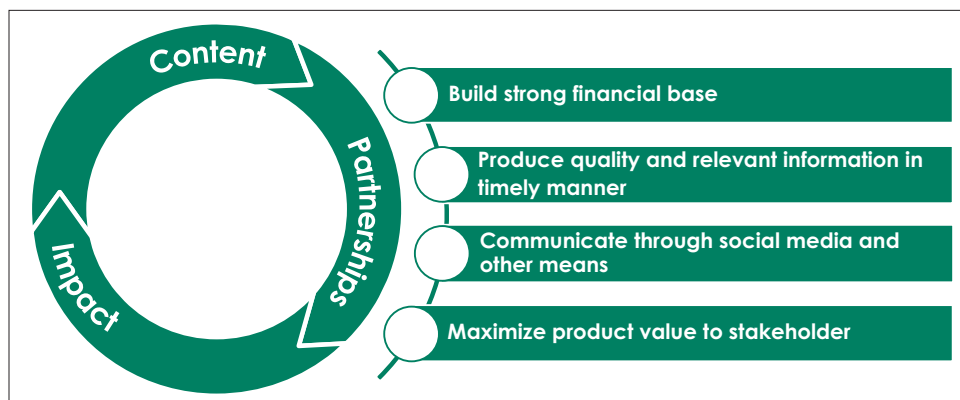
## CAST Governance Structure



The current governance structure of CAST was designed and implemented during an extensive reorganization in 2010. The three-part structure of boards—Representatives, Trustees, and Directors—provides wider input on topics chosen to become CAST publications as well as insights on the future direction of the organization. The CAST website in the About/Governance tab lists all current members of the three boards, as well as Past Presidents who have provided guidance for the organization.

## CAST ADAPTIVE PLAN FOR 2021–2025: *MAPPING OUR FUTURE*

Strategic plans for the organization have long been a part of the governance of CAST. During the 2019–2020 period, board members began work on a refined strategic plan for the next five years. Approved at the 2020 annual meeting, the Adaptive Plan for 2021–2025 was selected to build on previous successes while allowing CAST boards and staff more flexible execution in the future. This plan relied on extensive stakeholder feedback to identify stakeholder needs about the science of food and agriculture. As shown in the graphic, the plan designated three focus areas and four major desired outcomes. The CAST mission and vision statements were also examined and revised, as shown on the back cover of this publication. The complete text of the



current Adaptive Plan may be found on the CAST website under the About tab.

# PREFACE BY DIRK DROST

## BOARD LIAISON FOR IMPACT OF CAST STUDY

It is a joy to see this publication take shape through the commitment of the authors, editors, designers, and staff. It's good that we take time to celebrate the past and anticipate the future while remaining true to this organization.

This section—an analysis of the value and benefits of CAST—was initially conceived as an economic impact study. However, even though the economic benefit is important, it was clear to us that the impact of CAST is much greater than economic. Through the services of the Midwest Studies Group (MSG) approximately 50 stakeholders were interviewed and their input and feedback synthesized to identify the current benefits and value of CAST to its stakeholders, as well as the challenges and opportunities for improvements.

The study report identified several key themes, including adaption of communications, remaining true to the CAST mission and vision while adapting to the issues of the day, and preparing for the future while maintaining the organization and its effectiveness.

## OVERVIEW

In late summer of 2020, CAST contracted with MSG, a consulting group with expertise in non-profit strategic planning, to conduct this impact study through a series of stakeholder interviews on their views and opinions of CAST. These surveys were then conducted in January and February of 2021. One of the goals for CAST leadership was to understand the impact and importance of scientific information to all who might contribute and be impacted. One phrase that CAST leadership provided early in the process that stuck was to “move the needle” on various individuals’ attention to CAST and, in essence, be the “trusted source” for science of food and agriculture around the world.

The goal of this study was to discover input from stakeholders regarding CAST and furthering its missions in agricultural science.

## METHODOLOGY

One critical factor in conducting these types of studies is whom to interview. CAST identified a steering committee of former CAST presidents, trustees, and staff to identify the targeted stakeholder groups, as well as individuals who were representative of each of these groups. That process resulted in the identification of more than 90 individuals that was ultimately reduced to 50 to be interviewed with a few additional alternates.

An important variable in this study is the labeling of who is and who is not familiar with CAST. Through the initial conversations with CAST leadership, those 50 interviewees were narrowed down categorically to the following: 40 individuals were labeled as “familiar with CAST” while the remaining ten stakeholders were labeled as “not as familiar with CAST.” There are individuals you want to hear feedback from—even if they might be distant specifically to CAST. Depending upon the level of impact or gravitas this kind of individual has, it is a benefit to the entire organization.

All of the potential survey participants were contacted in advance by CAST leadership and asked to participate in this study. The surveys were conducted by MSG via Zoom in a very conversational format. Each interview included a set of standard

### 40 STAKEHOLDERS FAMILIAR WITH CAST

#### Interviewee's Background

##### Number of Individuals with Experience in the Ag Industry

17	University	1	Farm Bureau
3	Nonprofit	1	Dairy
2	University and Former Vet	1	R&D for Ag
2	Government Agency	1	Periodical
2	AgTech	1	Lawyer
1	Vet & Nonprofit	1	Edible Oil Chemist
1	Vet	1	Former CAST Staff
1	Producer Organization	1	Animal Science
1	Ag Trade Association	1	For Profit Ag

##### Number of Years Individuals Have Been in the Ag Industry

1	1-9 Years	21	20+ Years
3	10-19 Years	14	Life/Grew Up on Farm

#### Perceptions of CAST — What CAST provides the Ag Community

27	Objective Research / White Papers
10	Connecting with Others in the Industry
2	Other

### 10 STAKEHOLDERS NOT AS FAMILIAR WITH CAST

#### Interviewee's Background

##### Number of Individuals with Experience in the Ag Industry

4	Media	1	US Senator
3	Nonprofit	1	University
1	Social Media		

##### Number of Years Individuals Have Been in the Ag Industry

1	1-9 Years	4	20+ Years
0	10-19 Years	5	Life/Grew Up on Farm

questions for all participants and a separate but different set of questions for each of the two groups described above.

## SURVEY FINDINGS

Based on the topics of this study, the perception of CAST was on-track with no surprises as it relates to the foundation of the organization—that CAST produces “objective research and white papers” along with “connecting others in the industry.” Phrases such as, “CAST takes the complicated and makes it readable and understandable to the masses” (paraphrased) were offered.

Some respondents wanted to push into the human side of what CAST can do to increase its value, such as the idea of giving awards to presenters (and to publicly recognize those individuals). An idea was to perhaps send a media release on the award recipient to the local newspaper to foster word-of-mouth in various communities nationwide and globally.

There were many good ideas and insights in making the research papers more readable to everyday audiences—a goal

## Comments about what CAST provides the ag community

*"There are many journal articles that are hard to understand. CAST takes that information and makes it simple for other people to understand. This is what our legislators and general people need to read. People don't need to read these huge journals, just tell me what I need to do to make life better for me."*

*"The reports are objective. If you use one of their reports you are already further down the road when pushing for something, compared to if you didn't. It's because you can trust the facts."*

## What could CAST do more of, to increase its value to members, stakeholders, and audiences?

*"It's about putting as much resources in your communication team as much as you do your writing team. Being a good writer doesn't make you a good spokesperson. If we improve the communication team that is a benefit for all. Having a communications and lobbying team would help us communicate the broader picture and helps to make CAST more proactive."*

## What's the biggest challenge in food, plant, environment, and animal science today?

*"The challenge is the lack of knowledge of ag and technology between the general public and those making decisions, especially the support of those in the regulatory process. The communication and outreach is just as important as the research itself."*

*"The issue around sustainability. There is a movement across the globe to be more sustainable and deliver healthy and sustainable foods. What does that mean to change the food system to make things more sustainable?"*

## How can CAST better their model?

*"As scientists it is hard for us to be shortworded, but we have to because the public doesn't want to read long papers. They want to see 1 minute videos, and whether we like it or not, we need to figure out how to do that."*

*"We only speak to the choir but we need to speak to outside people more. There needs to be a stage which promotes communication that helps to market when newspapers come out. Where is that on the model flowchart?"*

of CAST leadership. Further ideas included CAST placing more resources toward communicating the great things CAST does to the degree CAST supports the writings involved was interesting. The very nature of this study and the ideas coming from the work will provide great benefit in this area. Of course, implementing various ideas, where feasible, will provide for sustainable communications.

CAST is in the right spaces to communicate its benefits properly amid the tech-explosion taking place, but how can CAST get the public as well as politicians to care about issues involving food, plant, environment, and animal science? One suggestion was to create various public forums to engage other stakeholders, not just CAST members, and provide the message to different groups. One specific idea was to get the science to be more relatable to the public. As can sometimes happen in studies, this is counter to some of the statements received earlier that CAST is not relatable to the public.

Many interviewees discussed the use of social media. Many respondents commented on how CAST should use video more. One respondent asked: Can CAST produce a one-minute video on something produced by an agricultural scientist? Can a ten-page research paper be summarized in such a short medium? Others mentioned making social media more fun and sincere rather than simply sharing stories and posts by others.

The section of the interviews asking about how CAST should communicate with science in their papers to key stakeholders and the general public started off with the comment that using academics is great, but take advantage of society members more. Is there room for making CAST research fun? Maybe CAST should consider creating a mascot or utilize a celebrity character to convey short and easy data to drive home the messages. For better or worse, one interviewee stated that CAST is the best kept secret in making a suggestion for better marketing.

There seemed to be the concern that policy makers and politicians were not receiving the communications coming from CAST and that by reversing this thought process, discovering what these individuals are seeking in the way of agricultural information and then providing the appropriate answers through research. One might consider going directly to those individuals while others might consider forcing the issue through a better social media presence.

How could CAST adapt its mission and vision for the future and what is CAST's focus to stay relevant over the next five to ten years? Ideas included expanding the CAST network wider than those already involved with CAST. There was the temperament of protecting truth-based statements, findings, and results regarding CAST research to thwart messages conveying untruths.

Policy makers advocated for a growing and diverse active membership as a focus. They suggested CAST become more aggressive in targeting various groups for inclusion into the organization, such as more women, minorities, younger age groups, and those not having agricultural backgrounds involved.

Another key audience came to light from a couple of stakeholders—college students. CAST may want to expand or include these students in contributing, becoming members, establishing advisory groups, and so forth.

There were many positive responses directed at the organization's leadership, mission, and effectiveness. Even while conveying that CAST could do more, the interviewees were positive, self-reflective, (e.g.: "...I can do a better job communicating with CAST as well"), and encouraging.

# KEY THEMES EMERGING FROM THIS STUDY

As a result of this study, CAST has identified four key themes to help navigate the future. These key themes are: continuing to pursue and build on CAST's vision; staying focused on CAST's mission while growing its impact; expanding CAST communications to reach and engage a broader audience and finally, growing CAST's membership by broadening and diversifying its representation. Each one of these themes provides a goal for CAST to work toward.

## THEME 1: CONTINUING TO PURSUE AND BUILD ON CAST'S VISION.

*CAST Vision Statement: A world where decision making related to agriculture, food, and natural resources is based on credible information developed through reason, science, and consensus building.*

How does CAST develop a more inclusive, multi-disciplinary, science-based model that seeks to inform our audiences about the science, technology, and innovation of food and agriculture?

## THEME 2: STAYING FOCUSED ON CAST'S MISSION WHILE GROWING ITS IMPACT.

*CAST Mission Statement: CAST convenes and coordinates networks of experts to assemble, interpret, and communicate credible, unbiased, science-based information to policymakers, the media, the private sector, and the public.*

How does CAST evolve its science communications efforts to remain viable and self-sufficient, but also nurture and grow the impact and relevance of the organization?

## THEME 3: EXPANDING CAST COMMUNICATIONS TO REACH AND ENGAGE A BROADER AUDIENCE.

How does CAST "think outside the box" to develop and evolve our current communication means to better reach and engage a new, more diverse, technology-driven audience?

## THEME 4: GROWING CAST'S MEMBERSHIP BY BROADENING AND DIVERSIFYING ITS REPRESENTATION.

How does CAST identify and secure new organizational members within the science community that focus on a broader base of agricultural issues across the food and agriculture system?

CAST leadership appreciates all the excellent feedback, input, ideas, and opportunities that were provided by the participants in this study. This format allowed for important details and discussion to be included beyond what was possible through the brief questionnaires that have been sent to stakeholders in the past, which were very helpful.

Further, the four themes above provide an opportunity to continue and expand on this ongoing discussion about the future of CAST. As CAST marks its 50th anniversary, a series of stakeholder engagement events are being planned that will provide the opportunity to listen, learn, and explore ideas, strategies, and new partnerships. These dialogues will be used by CAST leaders through an adaptive planning process to evaluate and implement ways to enhance and expand science communications around food, agriculture, and the environment.

## How could CAST adapt its mission and vision for the future AND what does CAST need to focus on in order to stay relevant over the next 5-10 years?

*"They need to make their network wider. It feels that their work gets to the people who are involved with CAST but doesn't reach the millions of people who are not."*

*"They have always been based on being objective. They need to continue that and if they do, that's a majority of what they need to focus on."*

*"Help people in the science system understand the importance of educational program of not just science but agriculture as well. Train young people and the public with educational programs to teach truth. Teach young people that agriculture is a great path as well. Right now all the glory is in science or being a vet. There isn't that same pride factor if a kid says they want to be a farmer."*

*"We need to figure out how to use the media to our advantage, as it seems stacked against us at times."*

*"Needs to take advantage of social media, short videos, and mediums that people use today instead of just writing papers. They also need some young blood with staff, contractors, board members, etc. Those types will have perspectives that will reach a younger generation that is being missed."*

*"I think they are moving in the right direction. Using a virtual environment has really worked out. We can now knockout more congressional meetings and that's something CAST should take advantage of. No longer walking from one side of the building to the other."*

## Additional comments

*"They have areas they need to improve but I have to say they do a great job with policy issues and finding the truth."*

*"Science is so important. I appreciate their focus on keeping that in the debate. So often we preach to the choir, so we need to figure out how to bring that to the consumer better. There is a lot of need to educate consumers and also figuring out what they want and how they want it, regardless, we just can't keep preaching to the choir."*

*"Very encouraged by all they have been able to do financially and with membership. I like the direction they are going, and their desire to get bigger and look towards the future. Things seemed pretty dark 10 years ago, but are coming back. We need to continue to look at bringing on more societies and bringing in more sponsors to help pay for the work being done."*

***"The future depends upon what we do in the present."***  
**— Mahatma Gandhi**

As we celebrate CAST's past and reflect on its current successes, we also need to look ahead to the future. What could or should it look like? That desired outcome should help inform and guide our actions going forward.

Toward that end, we invited three of our Borlaug CAST Communication Award recipients to share their thoughts, ideas, and challenges of communicating the science, technology, and innovation of food and agriculture. As recognized global leaders in science communications, we appreciate their experience and expertise, and value their input and guidance. Even further, these essays are designed to start a conversation with our members and stakeholders that will help CAST move forward in a more informed, progressive manner.



Dr. Alison Van Eenennaam is a Professor of Cooperative Extension in the field of Animal Genomics and Biotechnology in the Department of Animal Science at University of California, Davis. The mission of her extension program is "to provide research and education on the use of animal genomics and biotechnology in livestock production systems." She has served on several national committees including the USDA National Advisory Committee on Biotechnology and 21st Century Agriculture, (2005–2009), and was a temporary voting member of the 2010 FDA Veterinary Medicine Advisory Committee meeting on the AquAdvantage salmon, the first genetically engineered animal to be evaluated for entry into the food supply. Dr. Eenennaam received the 2014 Borlaug CAST Communication Award.

## STAYING FOCUSED ON CAST's MISSION WHILE GROWING ITS IMPACT

ALISON VAN EENENNAAM, PhD

*"CAST will provide a forum through which both congressional leaders and the general public can be provided reliable information — information on the problems affecting agriculturalists, including farmers, ranchers, research scientists, educators and agribusiness, and indirectly the nation's food supply. This action is particularly necessary today since 75 percent of the U.S. population is urban and another 20 percent live in towns and cities of various sizes. The urbanites have little or no concept for the (socio-economic) problems of the 4.5 percent of the population who produce the nation's food."*

— Dr. Norman Borlaug, 1970 Nobel Laureate  
**CAST ISSUE PAPER #1 entitled "Agricultural Science and the Public" January 15, 1973**

This quote from the first CAST Issue Paper is still largely true 50 years on, although now less than 2% of the population produces the nation's food, and the urban population is an additional generation removed from farming. And although most people do not produce food, everybody eats. And therefore, everyone has a direct stake in agriculture and food production systems.

If the SARS-2-CoV pandemic (COVID) tragically drove home one point — it is the very real dangers of how incorrect and anecdotal information can shape public perception, or even more perilously influence public policy. As public health experts watched the rapid spread of both the virus and misinformation with horror in 2020, I could not help but compare their plight with the communication challenge faced by agricultural scientists.

In the last century, the human population increased from 1.6 billion in 1900 to around 6 billion in 2000. Agricultural research fueled an avalanche of innovation which resulted in the dramatic reduction of life-threatening famine during the 20th century driven primarily by increasing yields. This has been called by famine researcher Alex de Waal, *"one of the greatest unacknowledged triumphs of our lifetime"* — although this feat is barely recognized by many.

However, there is still more work to be done, especially in the face of a changing climate. As bleak as the statistics of COVID-19 are, 3.7 million dead as of June 2021, more than twice that number, 9 million annually, die of hunger. Unlike the attention directed towards COVID-19, the annual humanitarian tragedy of starvation barely rates a mention on the news.

Few people are familiar with these global trends. Or the challenges that climate change — in particular the increased frequency of temperature and precipitation extremes, and crop pest and disease risks — poses to food security. Never has there been a more pressing need for scientific innovations to be incorporated into climate-smart agricultural production systems.

However, this comes at a time when there is an increasing distrust in the food system, especially among affluent urban consumers. This is often based on misinformation that is being promulgated by special interest groups or marketers with little appreciation of the implicit agriculture and food production tradeoffs associated with their campaigns. This is shaping public perception, as evidenced by the growth of products like

non-GMO salt, and hormone-free chicken. Obviously, salt does not contain DNA, and hormone use is prohibited in all poultry production systems. But if the COVID-19 pandemic has taught subject matter experts one thing, it is that it proves futile to counteract fear, uncertainty, and doubt with facts, explanations and data. The facts don't matter once the perception is that GMOs are dangerous, or chickens are "pumped full of hormones".

Misinformation that shapes public perception has real world consequences in terms of blocking access to useful innovations. In the same way that vaccine misinformation is ultimately harming public health, agricultural misinformation ultimately threatens food security. In the words of Reason's science correspondent Ronald Bailey, *"The beauty of pseudo-science is that it beats science hands-down. It is accessible, comprehensible, reachable, even desirable. Granted, it is not logical, responsible, practical, or dependable but then these are lyrics not virtues..."*

So what can CAST do to make its work "accessible, comprehensible, reachable, and even desirable"? While the past work of CAST has targeted policy makers with written educational materials and issue papers, this is not a format that effectively targets the general public. Communication is now digital. According to a 2021 Pew study, more than eight-in-ten U.S. adults (86%) say they get news from a smartphone, computer or tablet "often" or "sometimes," including 60% who say they do so often. And this number increased as the age of the respondent decreased, with 71% of those 18 to 29 getting news from a digital device often.

While there are many groups trying to influence public perception around food and agriculture with well-financed marketing and social media campaigns, there is a paucity of independent groups providing accessible and compelling evidence-based content to skillfully translate evidence-based agricultural science into "comprehensible, reachable, and even desirable" digital communications.

This is partly a funding issue. While crafty marketers can monetarize fear by pushing a pseudo-science narrative to sell their latest product for a premium, there is little incentive for academic scientists to devote their time to translating credible information on social media, let alone develop captivating YouTube content. And most likely they would not be very good at it. Moreover, even a well-liked TikTok video is unlikely to factor into a tenure and promotion package.

But there are talented individuals and groups that do this for a living. One example that I am aware of is content provider Kurzgesagt (translation – "In a nutshell"). This German-based, Patreon-supported company brings science to life making *"videos explaining things with optimistic nihilism"*. The team there *"want to make science look beautiful. Because it is beautiful."* Their 2017 nine-minute video entitled "Are GMOs Good or Bad? Genetic Engineering and Our Food" has almost 10 million YouTube views at last count. Likewise, their 2016 sixteen-minute video, "Genetic Engineering Will Change Everything Forever – CRISPR" has almost 22 million views.

CAST provides a wealth of science-based agricultural science content — what is lacking is the communication of this information to a wider audience. Equally, there are groups that are skilled at developing captivating social media content, who share CAST's mission of communicating credible, unbiased, science-based information. There would seem to be a mutually beneficial opportunity for CAST and their associated network of experts to provide the peer-reviewed background information

upon which social media content providers could develop compelling content. Or alternatively, for CAST to act as a resource for social media content creators, connecting them to scientists with relevant subject matter expertise to consult and provide an evidence-based fact check of materials they are developing. This could nurture and grow the impact and relevance of CAST to a wider audience. The independence of the content providers might additionally increase public trust in the credibility of the information being communicated.

It is hard to overstate the importance and relevance of innovations in agricultural science to issues of relevance and interest to the general public such as the environmental footprint of dietary choices, and affordable access to healthy, nutritious food. In discussing the famines resulting from a campaign against genetics and science-based agriculture led by Trofim Lysenko in the USSR from 1935 to 1965, and its disruptive effect on other aspects of agricultural and biological sciences, Dr. Borlaug warned in his CAST paper, *"this kind of experience could insidiously influence the capacity and capability of the U.S.A. to produce food, feed, and fiber. If our agriculture is prevented from*

*intelligently using the technology available to it and building further on these sound foundations so well devised and substantiated by our scientific community — it could happen here."* I think this cautionary tale remains relevant today.

Ideologically driven agricultural policy changes frequently have unintended trade-offs. In Europe for example, the European Commission recently proposed a policy imposing restrictions on European Union (EU) agriculture calling for a 20% reduction in the use of fertilizer, and 50% reductions in the use of pesticides and antimicrobials relative to 2020 levels. It also calls for 10% of existing farmland to be removed

from agricultural use, all by 2030. These "Farm to Fork and Biodiversity Strategies" represent a fundamental shift in EU food and agriculture policy. If adopted by the EU, a report<sup>1</sup> from the Economic Research Service of the USDA indicated these changes would decrease food production, raise food prices, and an estimated additional 22 million people worldwide, primarily in low- and medium-income countries, could become "food insecure" by 2030. The counterbalancing value of any environmental and human health (benefits and costs) of this policy to the EU and globally is subject to ongoing debate.

This example perhaps highlights the importance and pressing urgency of ensuring science-based information about agricultural inputs and trade-offs associated with forgoing technologies permeates the public discourse ahead of fears and misinformation. For CAST to remain relevant, the information it produces has to be more effectively communicated to a general audience. And that means working with new partners to produce "accessible, comprehensible, reachable, and even desirable" electronic and social media content to ensure the work of CAST impacts global discussions around food production and agricultural sustainability.

***"Misinformation that shapes public perception has real world consequences in terms of blocking access to useful innovations."***

<sup>1</sup> Beckman, J., M. Ivanic, J. Jelliffe, F. G. Baquedano, and S. Scott. 2020. Economic and Food Security Impacts of Agricultural Input Reduction Under the European Union Green Deal's Farm to Fork and Biodiversity Strategies USDA ERS. Economic Brief No. (EB-30).



Dr. Alexa Lamm is an Associate Professor of Science Communication at the University of Georgia in their Department of Agricultural Leadership, Education and Communication. Her work explores how to most effectively communicate and educate the agricultural community, decision makers and the public on key issues facing agriculture and the environment with a focus on water issues and climate change. Dr. Lamm has published more than 180 peer-reviewed journal articles, garnered more than \$42.6M in extramural funding, and presented her findings hundreds of times using traditional and non-traditional media methods. Dr. Lamm is also an international scholar, having conducted educational programs in more than 32 countries around the world and currently serving as the Executive Editor of the Journal for International Agricultural and Extension Education. Dr. Lamm received the 2020 Borlaug CAST Communication Award.

## EXPANDING CAST COMMUNICATIONS TO REACH AND ENGAGE A BROADER AUDIENCE

ALEXA LAMM, PhD

Fifty years ago, CAST existed as an idea, with the original creators envisioning a place or community that would bring people together to discuss and communicate about the latest innovations and advocate for agricultural advancement. Fifty years ago, we woke up to read our morning newspapers, possibly turning on the one television in the house to watch the news. There was no pause or rewind button and we could not even imagine accessing information in the palm of our hand. We relied solely on trustworthy journalists and news anchors to deliver our news, and we shared our research findings through printed journals and extension briefs/fact sheets that were mailed to university libraries, extension offices, and research stations. We literally lived in a different communication world when CAST was initiated than the one we live in now. While there have certainly been some big wins throughout the past 50 years, adapting to change — especially rapid technological change — can be extremely difficult.

The important thing to recognize is CAST, and its mission, is even more relevant now than it was 50 years ago. Considering the disconnect between much of society and agriculture, partnered with a general lack of public trust in science, the amount of work that needs to be done to showcase the power of and importance of agricultural science to decision makers, funders and the public that drive societal shifts is immense. So where does CAST go from here? How do we

**GROW, CHANGE, SHIFT, and EVOLVE** our current communication means to better reach and engage a new, more diverse, technology-driven audience?

I believe CAST can **GROW** by placing an emphasis on where people go for information. Research shows the American public obtains its news online, primarily from social media sources. Therefore, CAST needs to be on social media (win — because it already is!) but being present is not always enough. Social media only works if you have followers and followers that read and share your content. These individuals are obtained by being *interesting* enough to capture people's attention. Research has shown, posts are most likely viewed and shared if they use interesting visual images, video or animations. In fact, 80% of information obtained online is through video. In addition, catchy

consistent #hashtags and funny puns capture attention. Using stories to engage people by putting a face to science is a great place to start.

CAST needs to **CHANGE** their current communication efforts by bringing an agricultural and environmental communication expert to every team they create. Most land grant universities have departments that focus on agricultural education, leadership, and communication. The agricultural communication faculty and graduate students in the U.S. are incredible. They are teaching the next generation, are conducting groundbreaking research on how to communicate most effectively, and partnering with bench scientists across the agricultural industry on a myriad of interdisciplinary teams. These are the individuals exposed to the enablers and barriers to effective communication related to agricultural and environmental topics on a daily

basis and have a tremendous amount of expertise they can lend to CAST teams that will no doubt improve their success in sharing and advocating for agricultural science.

CAST also has an opportunity to **SHIFT** its efforts by prioritizing where time is spent. Communication efforts take a lot of time. Letting go of things that have been done, that seem important and have resulted in a moderate amount of success, can be difficult. However, it is impossible to embark on new efforts without eliminating others when resources (time, finances, etc.) are limited.

I believe the 50-year anniversary is a great time to take a step back and examine what is being done, decide if the time put into each and every effort is worth its impact on reaching the ultimate goals of CAST, and then strategically setting a few things aside to allow for innovative practices to emerge.

In a previous role, I conducted several annual public opinion polls on agricultural topics (similar to those conducted by Pew Research Center). We asked all kinds of questions and generated 30-40 page reports several times a year detailing what the American public thought, posting the full reports along with 2-page infographic summaries to our website ahead of peer reviewed publications. This was done to ensure the information was available in real time with the intent of driving policy decisions. The full reports took weeks to generate and the sense of

*"CAST, and its mission, is even more relevant now than it was 50 years ago."*

urgency created a lot of stress. After several years we looked back at the use of the materials based on website downloads and views. It turns out the stress inducing full reports had only been looked at a few times each year with the summaries downloaded on a regular basis. The website analytic data allowed us to step back and decide we were no longer going to create the reports we all felt were so important but rather create clear, concise, short infographic summaries of the most important data. We found it was okay to wait on peer reviewed publications to release the rest of the information. I share this story because it is relevant to CAST and its communication future. Just like any organization, I am sure there are several extremely important, stressful communication pieces being created each year. However, if these pieces are not being used — or not having the impact we were striving for — there may be a better way to share the information.

Finally, I believe CAST can **EVOLVE** by viewing their communication efforts as a work in progress. Staying relevant and engaging a new, more diverse, technology-driven audience is like trying to hit a moving target. One week a topic or post is trending and the next it is out of date and forgotten. The same goes for social media platforms. Gen Z currently views Facebook as the platform their parents use while SnapChat and TikTok are their preferred modes of communication. The speed with which things change as new #trending channels emerge means the previous statement I just made may be out of date by the time this is published. The constant amount of change in how to communicate can be overwhelming and discouraging but can also be viewed as an opportunity or challenge. I would like to see CAST

accept the challenge of this constantly moving space! Why not see if CAST can get creative in developing content that trends on these sites. By engaging with social media influencers that already have strong followings and believe in CAST's message, vision, and mission, CAST does not have to go it alone. Instead, CAST has an opportunity to engage and educate a few key individuals that already know how to tweet, #hashtag and trend and can use their existing following to their advantage.

You may ask, who these influencers are and how CAST can elicit partnerships. Luckily, the land grant university system has an amazing network of 4-H and FFA alumni that are now celebrities in a myriad of areas (e. g. performers, actors, celebrity chefs). Each and every one attributes much of their success to the youth program they were involved in and are often looking for a way to give back. Most of the time they have never been asked to support agricultural science or to work as an advocate for communicating science and are very willing to partner with credible groups, like CAST. Working with alumni associations for these two powerful organizations would be a great place to start in launching an influencer-based communication strategy.

No matter how CAST chooses to grow, change, shift and evolve in their communication efforts, I have no doubt the disconnect between much of society and agriculture will be reduced thanks to CAST efforts. As a credible source with the right partners, CAST is strategically positioned to have a definitive impact on how agricultural science is received by decision makers, funders, and the public.

***"CAST is strategically positioned to have a definitive impact on how agricultural science is received by decision makers, funders, and the public."***



Dr. Kevin Folta is currently a professor of molecular biology and genomics, as well as a strategic communications consultant and podcast host. He has provided more than 300 seminars and training sessions to teach scientists, farmers, and agricultural industry professionals how to effectively connect with clientele and the broader public, particularly through social media. He advised corporations and municipalities to build employee compliance with pandemic vaccination efforts. He hosts the weekly *Talking Biotech Podcast* with more than 20,000 monthly downloads. Kevin also produces unique seasonal fruits for farmers' markets. Dr. Foltareceived the 2016 Borlaug CAST Communication Award. The views expressed here are not those of his academic employer and are presented independently of his appointment.

## WHAT CAN WE LEARN ABOUT COMMUNICATION FROM TWO INFODEMICS?

KEVIN FOLTA, PhD

***Information only flows through a conduit of trust, trustworthy or not.***

### 1. An Introduction to Two Infodemics

Observing the public controversy during the COVID-19 pandemic was a lot like following the arguments against agricultural

biotechnology, only at break-neck speed and ear-bleeding volume. As public guidance to mitigate the impacts of the pandemic emerged, polarizations and possies were quick to form, and social tribes coalesced around fuzzy political lines and ideological leanings. Personalities with opinions contrary to the scientific consensus raised fists and raised fear, and infected social media (and sometimes conventional media) with a plague of uncer-

tainty and doubt. The goal was to delegitimize the research and erode trust in official scientific guidance. Scientific experts were described as shills, dupes, and patsies, or worse, criminals. It was a grim reminder that evidence and data from a legitimate scientific community are often not nearly as compelling as the specter of deadly risk on a happy website.

To some of us this is familiar territory. Scientists with concerns for food security and public health have become entangled in both vaccine and biotechnology discussions. What is common between two issues best described as **scientific consensus / public contentious?** In both cases, many in the public remain skeptical of the science. That's okay, as skepticism toward new technology is healthy and sometimes warranted. Unfortunately, there are personalities and industries excited to foment dissent against new technology, for profit or for ideological or political gain.

The question remains, why is legitimate science not as compelling as fantasy claims, and how can we recraft our messaging to create positive change?

## 2. The Voices of Opposition

For instance, twelve accounts on Twitter released 65% of the anti-COVID-19 vaccination content (Martin 2021). The accounts belong to established personalities that claim to be experts in public health and espouse opinions based on alternative medicine approaches and generally flimsy science. They include internet celebrities, YouTube personalities, some with alleged medical credentials that give them an air of credibility, even when prescribing advice that runs contrary to public health guidance and a sound scientific consensus. Alternative health and pro-conspiracy business, fronted by a palatable personality brand, can profit immensely from engagement through monetized traffic (Ryan et al. 2020) or sales of products or services.

The fringe pushback against COVID-19 health efforts is eerily similar to tactics deployed against biotechnology. While overwhelmingly supported by scientists, the use of biotechnology in crop improvement has faced decades of push back from a handful of websites, NGOs and websites that learned to carry a heavy, non-scientific influence. Social media, websites, documentaries, and public rallies decry the solutions of plant biotechnology, painting a technology shown to be good for farmers and the environment (Brookes and Barfoot 2014, 2020; Kathage and Qaim 2021; Scheitrum, Schaefer, and Nes 2020) as evil and destructive.

There are parallels between rejection of technology in agriculture and shunning public guidance in a pandemic. First, both feature large multinational companies offering new technology with little communication around the roll-out. Second, both spawned feeble communications efforts that at best offered a punch of information, which does not correct the problem (Reincke, Bredenoord, and van Mil 2020). Today many communicators persist in this parade of foibles, and attempt to bury public concerns with an avalanche of sophisticated data points. It has been shown that simply showering someone in data contrary to their position actually fortifies their errant belief (Wood and Porter 2019). The learned lesson is that the facts do not matter until trust is established.

## 3. The Barrier of Trusted "Experts"

While those touting new technology can't seem to get out of their own way, a number of individuals have published work

that has swayed public opinion and policy, yet remains highly criticized by the scientific community. The published work suffers from remarkable flaws in scholarship, statistical power, or experimental design. These papers rely on persuasion through logical fallacy, presenting selective support that reinforces the conclusions they powerfully declare. The reports do not influence the course of scientific research, but they certainly sway malleable governments and juries, as well as fuel public controversies. Such work appeals to the biases of those they wish to compel, and builds trust based on that common belief.

There are several well-known examples. A report in September of 2012 sent shockwaves around the world with its gruesome images of tumor-bound rats, allegedly caused by the GE crops in their feed or by the herbicide glyphosate. The published paper in a reputable journal immediately froze efforts to approve GE crops in the Developing World (Owino 2014) and brought crop biotechnology to a screeching halt worldwide. A complete analysis of the work's flaws is presented elsewhere (Arjó et al. 2013). In the time since, three independent EU studies spending over €15 million failed to reproduce the original results (Zeljenková et al. 2016; Goedhard and van der Voet 2018; Coumoul et al. 2019).

The articles by Seneff and colleagues connecting vaccination and autism (Seneff, Davidson, and Liu 2012), the dangers of COVID-19 mRNA vaccines (Seneff and Nigh 2021) and the connection of the agricultural herbicide glyphosate to dozens of maladies (Samsel and Seneff 2013a) have driven a wedge of peer-reviewed legitimacy to fracture trust in consensus science. The constellation of articles feature bountiful cherry picking harvests, masterfully assembled inferences and statements from legitimate (oftentimes predatory or weak) published work to

support a hypothesis that has little to no actual experimental foundation. The author teams assemble tenuous links between glyphosate and celiac disease (Samsel and Seneff 2013b), cancer (Samsel and Seneff 2015a), ALS/Parkinson/Alzheimers (Samsel and Seneff 2016 a,b), autism (Beecham and Seneff 2016), and many implied causalities that have not been verified experimentally or epidemiologically. These works straddle a border between opinion and motivated scholarly review, some now almost a decade old and not aging gracefully. One of these articles is so rife with cherry picked statements and sources (as the journal

notes, "bias in the choice of citation sources used in the article") the journal added a disclaimer to its online title page.

During the COVID-19 pandemic we witnessed the development of multiple vaccines that were administered with great efficacy and safety. The data were clear — vaccination protected against severe symptoms, hospitalization, and death. Still approximately 50% of Americans refused to receive it. However, the same cohort happily consumed unproven nostrums promoted by internet personalities or politicians. The proven was dismissed, the unproven (and perhaps dangerous) was accepted as a remedy.

How can this happen? Why does the public trust dubious information but not information from vetted, reproducible scientific research? If we understand what trust is, the answer becomes clear, and provides a roadmap for scientists to earn the trust necessary to combat misinformation.

## 4. The Chemistry of Trust

Why does someone shun an effective, safe, and free vaccine and instead opt for ineffective livestock dewormer? It is because

**"...facts do  
not matter  
until trust is  
established"**

the information they accept comes from individuals and/or a trusted community. These influences are extremely powerful, and can be extremely dangerous, especially in a pandemic. Why are these sources trusted?

In the book "The Trusted Advisor" the authors presented the **Trust Equation** (Maister, Galford, and Green 2021). In its simplest form, the Trust Equation is a relationship between four factors:

$$\text{trust} = \frac{\text{competency} + \text{reliability} + \text{intimacy}}{\text{self motivation}}$$

### **What are the elements of trust, and how can we use them to better convey scientific information to recalcitrant audiences?**

**Competence:** (e.g. Your Expertise) Scientists and farmers excel in this area. They are the experts; they know the subject. This is where your time in the profession matters, where your training, degrees, awards and recognition matter. Staying in your lane, not speaking beyond expertise, and remaining current in your subject. If you don't know an answer, know where to find it.

**Reliability:** (e.g. Will You Do It?) This is one place where the legions of experts can use some work. You may be competent, but are you willing to engage? Many say they don't want to confront others with varying opinions in social media space. After all, they exude competence, they are trained and have advanced knowledge from reading the thick books or from seasons of cropping 4,000 acres. Why grapple in the comments section of a Facebook article with a clueless troll searching for attention? This is the first vulnerability to earning trust — an unwillingness to engage those that spread false information.

**Intimacy:** (e.g. Do You Care?) Scientists and farmers fail at efforts of demonstrating intimacy, which simply means demonstrating care for others. It is a key aspect of determining trustworthiness. Are you listening? Do you invalidate others' concerns? Do you share common concerns?

**Self-Motivation:** (Who Are You Working For?) The denominator of the Trust Equation is defined by your motivation, or as the authors describe it, **self-orientation**. If intimacy is a question of do you care, motivation is why you care. Are you in it for the public good or for a quick profit? Are you employed by a company to push a solution, or are you objectively communicating from a scientific consensus?

While the Trust Equation provides some excellent engagement advice, it is just the first step. There are overlays from worldview, community pressure, and other forces that you simply can never overcome. Nonetheless, it is critical to remember that someone may be observing your behaviors and listening intently to your words, so engagement to adjust the elements of the Trust Equation is still necessary.

Once you understand someone's position and how they got there, as well as where they want to go, you can then start to assemble the scientific argument. Listening and values-based priming is critical to breaking the barriers assembled in the resistance to scientific information flow.

## **5. Applications of the Trust Equation in Conscientious Engagement**

How do we address misinformation and disinformation?

Effective change comes from building rapport with the audience. It is taking an interest in the position of those presenting false information, *not listening to debate*, but *listening to understand*. It builds a sense of empathy, interest in someone else's feelings, and increases the intimacy factor in the Trust Equation. You do not have to agree with someone to understand them. The intimacy factor in the Trust Equation increases with an emotional connection.

The second step is connecting through common concerns. Finding a values bridge, a common set of interests shared between both parties, helps align both parties toward a set of shared interests, uniting toward an agreeable goal. This step defrays the denominator of the Trust Equation, as your motivations align. For instance, build a bridge of common concerns and values that demonstrate you care about the same goals, perhaps public health, food security, farmer economic stability, or environmental sustainability.

State your **Why?** Why do you do what you do? Why do you care? Your rationale is grounded in an outward reaching, altruistic concern, not because there is some self-reward. A decreased sense of self-motivation is also fostered by transparency and authenticity, two factors that greatly contribute to trustworthiness.

Always think of the trust equation when connecting in social media. Remember that the internet is a spectator sport. A substantial number of Americans receive their news from social media, namely Facebook and Twitter. They not only read the stories, they peruse the comments, many searching for opinions that reinforce their own. However, **there is a substantial population that is concerned about health, food, and farming — and they don't know who to trust.** They are trying to figure out who

is presenting the credible information. This is your audience as science and agricultural communicator.

## **6. In Conclusion**

The public controversies in COVID-19, vaccines and crop genetic engineering share similar attributes and trends. In all areas, the evidence contributing to a scientific consensus is remarkably clear. At the same time the internet is full of misdirection and false information, promoted by many merchants of doubt — from flourishing entrepreneurs to agenda-motivated scientific experts who fail to execute responsible scholarship. The public may be agnostic, sometimes hostile to scientific evidence.

Individuals follow the guidance of those that reinforce their opinions and deeply held beliefs. It is not about science and evidence. The internet confirms and reinforces these biases. To reverse them is not simple, but requires the engagement of credible authorities. It is not enough to simply engage, it is necessary to do so in a soft and charitable way that builds trust, mostly by employing active listening, understanding their concerns, and presenting evidence that reinforces common values.

Engagement using this formula is effective, and it must be deployed in social media, where misinformation thrives and many retreat for news and information. Compassionate engagement that acknowledges concerns and speaks to values can open channels where legitimate evidence may flow. Charitable conversations can have a profound effect on collateral influence of other observers who are unsure of who to trust.

***"Listening and values-based priming is critical to breaking the barriers assembled in the resistance to scientific information flow."***

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Worldwide visits to the CAST website in 2020

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Here's how to help CAST make a greater impact through connecting, communicating, and contributing!

### CONNECT.

- Follow CAST on **Twitter**, "like" and engage on our **Facebook** page, and share the CAST **blog** and **videos** to boost our reach.
- Attend a CAST webinar or in-person event announcing a new publication or activity, and encourage your colleagues to do the same.
- Utilize CAST study guides and educational resources for online learning or in-person instruction.

### COMMUNICATE.

- Suggest a scientific agricultural topic for a new CAST paper through our website.
- Share CAST press releases, news announcements, and resources.
- Offer a testimonial on how you have benefitted from CAST reports in your work or classroom.

### CONTRIBUTE.

- Support CAST's mission by joining as an individual member.
- Ask your employer to match your annual CAST contribution and/or join as a corporate, nonprofit, society, or university member.
- Mentor/Support a science communicator through a gift of an annual individual membership.
- Make a tax-deductible donation of any size to support CAST's general mission or a particular publication.
- Include CAST in your estate plan to help continue a strong legacy of science communication.



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## MISSION

CAST convenes and coordinates networks of experts to assemble, interpret, and communicate credible, unbiased, science-based information to policymakers, the media, the private sector, and the public.

## VISION

A world where decision making related to agriculture, food, and natural resources is based on credible information developed through reason, science, and consensus building.



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