



The video origin of the myth that global warming is good for agriculture

Two '90s-era coal-funded videos on CO2 featured government scientists who say their comments were misleadingly edited. How it all happened.

Karin Kirk

September 27, 2020

Misinformation is at the root of many scientific controversies, and fighting it can feel like a losing battle. But one effective method is to expose the mechanics of misinformation, to show tactics and deceptive processes in broad daylight.

And learning from the past can be key to combating persistent misinformation campaigns currently and, no doubt, again in the future. “Those who ignore history,” writer and philosopher George Santayana taught us, “are bound to repeat it.”

A pair of widely circulated climate misinformation videos from the 90s – “The Greening of Planet Earth,” and “The Greening of Planet Earth Continues” – were funded by the benignly named Greening Earth Society, whose membership consisted of coal interests. Featured in the video were U.S. government civil service scientists who had no idea they would land in the midst of a pro-pollution/pro-CO2 narrative. Special interests supporting use of fossil fuels used the inclusion of the scientists, which seemed to give the video credibility, to cast doubt on the idea that climate change would harm people and ecosystems.

An early example of a longstanding tactic to mislead

The two videos in question were released in 1992 and 1998. But more than 20 years later, their legacy lingers.

The videos were widely distributed to classrooms and found their way into bibliographies and lecture halls. The 1998 edition was distributed widely on Capitol Hill. Both tout the once-common claim, long since debunked, that adding more carbon dioxide to the atmosphere would lead to larger plants and a better and greener world. It was a misleading assertion: The videos did not address the fact that rising carbon dioxide levels would also boost weeds and poison ivy. Nor did they grapple with the impact on crops of climate-change-induced heat stress, drought, wildfires, or the expansion in range of insect pests and livestock diseases. Today, reputable scientists expect that higher temperatures will lead to reduced yields of major commodity crops.

Yet the tired myth promoted in the videos persists.

At America Out Loud, a fringe talk radio platform and website, a [June 2020 article](#) describes carbon dioxide as “plant food, the very opposite of ‘pollution.’” The article also repeats the

misleading claim from the “Greening” videos that “More CO2 means free, rich fertilizer and thus increased yields of food crops.”

To Harvard University science historian and author Naomi Oreskes, the two videos, funded by the now-defunct Western Fuels Association, were instrumental in helping create the myth that higher levels of carbon dioxide in the atmosphere are overwhelmingly positive for plants, crops, food supply, and humans generally. She points to witnesses testifying on Capitol Hill in the past few years repeating that key point emphasized in the videos. That pro-carbon dioxide point “is still a live meme,” Oreskes said in a recent phone interview. “It is still alive and well and living on K Street,” she said, referring to Washington, D.C’s “lobbyist’s row.”

Science historian and author Spencer Weart pointed to William Faulkner’s quote that “The past is never past, it’s not even past,” and said “zombie ideas” like those expressed in the two 90s-decade videos initially “sound plausible” to some, take on a life of their own, and are still being circulated.

Years of research discarded during editing

Several government scientists who appeared in “The Greening of Planet Earth” now say they were basically duped. They say they were not told the purpose of the video at the time of the recording, and at least in one case a scientist felt pressure to comply.

The three former U.S. Department of Agriculture research scientists individually discussed their roles via Zoom calls reflecting on their research on CO2 and agriculture, and on the events that led them to be caught off-guard about how their research was presented.

The scientists say they did not then or currently think that food production would increase in a CO2-enriched atmosphere, and their research then and since shows the opposite. The filmmakers simply edited out the scientific context, stripping away anything counter to their intended message that CO2 is beneficial for humanity and for food production. Their research efforts – experimental design, diligent data collection, and important results – were discarded on the editing room floor.

Lewis Ziska, Ph.D.: ‘I did not know who they were’

“Basically I was in the dark,” said Lewis Ziska, a plant physiologist who worked at USDA at the time. In the video, Ziska explains how more CO2 in the atmosphere could increase the yield of rice. But he didn’t know the purpose of the production, nor did he know it was funded by the coal industry. “I did not know who they were,” Ziska recently said of the filmmakers. “I was only doing it because my boss said, ‘Oh, there’s a film crew here.’”

Although it’s true that CO2 enhances plant growth, that’s only one of many factors that influence plant health and crop yield. Ziska attempted to round out his explanation of enriched CO2 on agriculture: “I turned to the producer and I said, ‘Would you like to know how carbon dioxide affects weeds?’ And he said no.”

Then, Ziska was told to sign a waiver of some sort. “I signed the release form while the [USDA] national program leader was standing with the producer, and I knew that if I didn’t do this, he would be upset.”

Several months later, the completed video arrived in Ziska's mail. He learned only then that the video had been produced by the Greening Earth Society, an organization created by a coal industry trade group, the Western Fuels Association. The VHS cassette and accompanying literature had been sent to every Capitol Hill legislative office in Washington D.C., according to [Climate Files](#).

Ziska watched the video and thought, "OK, what do I do now?" He considered his options: "I'm a young scientist at USDA and do I want to make waves? Do I want to complain?" He opted not to raise the issue. "Okay, well, learn your lesson and move on," he recalled, holding up his arms as if signaling defeat.

James Bunce, Ph.D.: 'I disagree with most of it'

James Bunce is another USDA researcher appearing in the video campaign. In his segments, he explained that increasing CO₂ could help plants grow in drier environments. Like Ziska, Bunce says he did not know the genesis or focus of the video project. But unlike Ziska, Bunce had only recently seen the final product. "I certainly do not endorse the conclusions they drew from those facts!" he wrote in an email.

"I have only the vaguest recollection of having been taped for it," he said, explaining that media interviews at that time were not uncommon for government research scientists. "We're instructed to be open to public questions."

What does he think of the video now that he's seen it? "Well, I disagree with most of it," he said.

Bruce Kimball, Ph.D.: Edited to 'suit their sound bite'

Bruce Kimball is a soil scientist who appeared in the 1992 video, with the same theme and format as the 1998 version. He still recalls the interview: "They had about 20 or 30 questions, and every one of them could be answered with, 'CO₂ is good for plants.'"

When the video was filmed, Kimball was under the impression that the interview would be about the research he was doing, but the topic never came up. "When they came to the end of their questions, I said to them, 'Aren't you going to ask me about the experiment?'" The camera crew obliged, and Kimball went on to describe his work with CO₂ enrichment on crops. But all of his explanations were left out of the final product.

When Kimball saw the video, he realized the only clips included were the ones "that best suited their sound bite."

Anatomy of misinformation

The Greening Earth Society endeavored in both videos to make only one point: CO₂ is good for plants and thus global warming will be "modest and benign." Editing stripped away the real scientific context, leading to a deceptive message at wide variance from the evidence accepted within the science community.

"A lot of the scientists they interviewed, on very specific questions, gave correct answers," Bunce said. But the framing around the scientists' quotes led to a mistaken impression far from what their research showed. "It's the interpretation that I'm sure a lot of the scientists would not agree with," said Bunce.

Case in point, Ziska, Bunce, and Kimball all said they stand by their original remarks, but each disagrees with the larger point.

“You’re only seeing a very small slice of the science,” Ziska remarked while holding up his thumb and forefinger, allowing a sliver of light to pass through. “And it’s the rest of it that needs to be explored.”

Concern that USDA scientist ‘went off course’

Among the staff of USDA researchers at the time was a physicist named Sherwood Idso. Bunce, Idso, Kimball, and Ziska were part of the USDA’s Agricultural Research Service, or ARS, where they did experiments on how crops responded to carbon dioxide, water, and various nutrients.

Idso carried out taxpayer-funded research on CO₂ and plants, and he eventually leveraged part of that background to the benefit of fossil fuel interests. Idso’s own Institute for Biospheric Research produced the first Greening Earth video in 1992, nine years before he officially retired from the Agriculture Department and from civil service. Six years later, he participated in the second video with the same basic script, and again funded by the Western Fuels Association.

Reflecting on Idso’s role at ARS, Bunce said, “He made a name doing some reasonably good things. And then he went off course.”

Bunce said that Idso “went into this side business, which I don’t think anybody in ARS agreed with. The basis of what he was saying with the Green Earth stuff – I don’t think anybody agreed with him on that.”

Nevertheless, Idso remained an active part of the ARS while simultaneously working to undermine climate science on his own. Bunce recalls that his peers “knew [Idso] was way off base, and were amazed that he was allowed to do that as an ARS scientist.”

Kimball had dual roles with Idso, working both as a collaborator and also as Idso’s supervisor. “I tried to supervise him for a while,” Kimball said, recalling their complex working relationship. “I’ve argued with Sherwood Idso a lot,” he said. “I kept telling him, ‘Stick to the data, stick to the data.’”

Kimball and Idso worked together on a 17-year long experiment growing orange trees in elevated CO₂ conditions. The project’s final publication makes no mention of the trees benefiting from climate change, even though the trees grew quickly with a boost in CO₂. Instead, the results are expected to be useful to quantify carbon sequestration in forests, and to manage forests and agricultural production in our high-CO₂ future.

“I felt I was caught in the middle in a lot of ways,” said Kimball recently, with a sense of bittersweet empathy for his former colleague. “In many ways he was a really excellent scientist. But he would extrapolate beyond the data.”

Retirement from USDA to ‘unfettered’ rejection of climate science

After 34 years at the Agricultural Research Service, Idso retired from government service in 2001. The Agricultural Research Service’s Water Conservation Laboratory’s annual research report that year was dedicated to him, calling him one of the laboratory’s “most productive scientists” and saying he was widely cited in the scientific literature.

The dedication noted that Idso had authored over 480 official publications for USDA “and 88 more on his own time, including a pair of influential books on carbon dioxide and global change.”

Those “influential” books seeking to cast climate change as a “fortunate and desirable phenomenon” — self-published by the Institute for Biospheric Research, Idso’s own organization — were widely discredited by climate scientists.

The closing statement of Idso’s retirement dedication hinted at what was to come as Idso narrowed his focus to full-time work on what he saw as the benefits of CO₂ and of climate change: “We wish him well in his new endeavor – unfettered by reviews, approvals, and Form 115s!” (A form 115 is part of the USDA’s internal approval process for publishing research results.)

Idso and his two sons, Craig and Keith, went on to launch and run the Center for the Study of Carbon Dioxide and Global Change. Craig Idso has worked with the Cato Institute, and the Heartland Institute, and he was a former director of environmental sciences for Peabody Energy, the world’s largest privately owned coal company. Keith in the early 2000s served as an officer of the Idso-led center and wrote and testified in a few instances sharing views in support of higher CO₂ concentrations.

A primary goal of their efforts was and remains the dismantling of EPA’s 2009 Endangerment Finding, which requires greenhouse gases to be regulated. The center’s webpage asserts that EPA’s landmark ruling failed to account for the “very significant” benefits of CO₂ emissions. They continue to swim upstream on climate science. “To attack CO₂ is to attack human prosperity,” reads the banner text on a 2019 YouTube video narrated by Craig Idso.

According to the organization’s website, it still has financial ties to the fossil fuel industry. Its webpage describing its funding sources claims independence, but acknowledges that “ExxonMobil made some donations to us a few times in the past; they probably liked what we typically had to say about the issue.”

Craig Idso defends his father’s legacy

Asked to comment for this article, Craig Idso replied on his father’s behalf, saying the elder Idso’s health prevents him from communicating directly. Criag Idso wrote in an email that his father’s involvement was “being filmed for the project and recommending other scientists who might be willing to share their research.” He said the elder Idso was not “involved in deceptively editing content.” He said also that USDA “played no role whatsoever in the production of either video,” although USDA scientists were featured in both.

Turning to the science, Criag Idso said “the accuracy of the message” in both videos “has withstood the test of time. Enriching the atmosphere with carbon dioxide has indeed benefited Earth’s biosphere.” He said “many updated peer-reviewed science papers” support that conclusion and “confirm the thesis put forth in the two Greening of Planet Earth videos from the 1990’s that rising CO₂ will enhance the productivity of the planet’s vegetation. Quite frankly the data confirm it has,” he wrote.

Agriculture experiments portend a decline in crop yields

It's widely accepted that plants grow faster with additional CO₂ in the atmosphere, whether in a greenhouse or in an open field. But the error propagated by the Greening Earth Society and its videos was to exclude susceptible plants and crops and other variables from the equation.

Ziska named a list of the ways additional CO₂ affects agriculture:

“The goal from the other side was to show how wonderful CO₂ is because it makes plants grow more. Without recognizing that, okay, so it's only going to affect strawberries but it's not going to have any effect on poison ivy? It's not going to affect invasive weeds? It's not going to affect the quality of the food that we have? It's not going to affect how we use pesticides or herbicides?” He continued: “It's not going to affect the pollen that we come into contact with? It's not going to affect plants' toxicology, it's not going to affect the ability of plants to produce volatile organic carbons which contribute to smog, it's not going to affect biodiversity, it's not going to affect the entire food chain?”

Ziska paused briefly to take a breath. His voice had an edge to it. “Well of course it's going to do all those things.”

Bunce was also eager to fill in the science he feels had been left out of the video. “When you add warming to increasing CO₂, the net [result] in many, many important crops is negative.” Controlling the experiment for warmer conditions – not just elevated CO₂ – reduced crop output “almost all the time.” The notion that CO₂ would somehow protect plants from damage from high temperatures “has been thrown on its head by experiments,” he said.

Kimball's research showed the same results. In one instance, the combination of elevated CO₂ and warmer temperatures benefited yields of grasses in Wyoming's cool climate. But in most other cases, when crops were exposed to elevated CO₂ and warmer temperatures, crop yields went down. This was true for soybeans and corn in the Midwest and for wheat and rice in China, where “CO₂ caused small increases in yield, but warming caused severe decreases in rice yield.”

Changes in precipitation patterns add yet another wrinkle to the complexities of agriculture in a warming planet, as floods and droughts disrupt crop yields. “A place like Arizona that's already dry is probably going to even get drier,” Kimball noted, “which is pretty damn scary.”

Ziska in 2018: ‘Okay, I’ve had enough’

Ziska's research has come a long way since his days as a junior scientist making an unintended cameo in a P.R. piece. But the USDA has changed too, particularly in recent years. In 2018, Ziska was one of the authors of a landmark study that showed that rising CO₂ diminishes the nutritional value of rice. The research team found that elevated CO₂ concentrations create an imbalance within the plant's chemical makeup as CO₂ becomes disproportionately large compared to other elements of plant growth. “The entire elemental balance is out of whack,” Ziska said.

That 2018 study concluded that rice grown in high-CO₂ conditions had lower quantities of protein, iron, zinc, and B-vitamins. Because rice is the world's single most important food crop, the effects of reduced nutritional value are profound, particularly for lower-income parts of Asia.

After the paper was published in Science Advances, USDA stepped in to downplay the work. First, the agency claimed the findings were incorrect, even though the research had already been through rigorous peer review and internal review within the ARS. Next, USDA declined to issue

a press release about the paper, and, according to a [story in Politico](#), pressured institutions of collaborating authors to pull the plug on press releases that had already been written.

Despite USDA's efforts to bury the publication, the far-reaching results were newsworthy, and Ziska was approached for media interviews. Ziska's bosses denied him permission to do the interviews.

“At that point, that's when I said ‘Okay I've had enough.’ Ziska said. He left the USDA both out of frustration and as a symbol of protest. Ziska now continues his work as an associate professor of environmental health sciences at Columbia University.

Ziska presses on, convinced that his work carries real importance for public health. As science of all types is enduring pointed partisan attacks undermining the seriousness of issues from COVID-19 to climate change, he says he some days is tempted to crawl under his desk.

But Ziska feels society may be reaching a crossroads. He says he hopes strengthening public acceptance on the importance of sound science and public health will spur a change, “politically, culturally, and socially — to make things better.”