AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

REVIEWING THE STATE OF ORGANIC AGRICULTURE—PRODUCER PERSPECTIVES

HEARING

BEFORE THE

SUBCOMMITTEE ON
BIOTECHNOLOGY, HORTICULTURE, AND RESEARCH

OF THE

COMMITTEE ON AGRICULTURE
HOUSE OF REPRESENTATIVES

ONE HUNDRED SIXTEENTH CONGRESS

FIRST SESSION

OCTOBER 30, 2019

Serial No. 116–22



Printed for the use of the Committee on Agriculture
agriculture.house.gov

U.S. GOVERNMENT PUBLISHING OFFICE
38–549 PDF WASHINGTON : 2019

COMMITTEE ON AGRICULTURE

COLLIN C. PETERSON, Minnesota, *Chairman*

DAVID SCOTT, Georgia
JIM COSTA, California
MARCIA L. FUDGE, Ohio
JAMES P. MCGOVERN, Massachusetts
FILEMON VELA, Texas
STACEY E. PLASKETT, Virgin Islands
ALMA S. ADAMS, North Carolina
Vice Chair
ABIGAIL DAVIS SPANBERGER, Virginia
JAHANA HAYES, Connecticut
ANTONIO DELGADO, New York
TJ COX, California
ANGIE CRAIG, Minnesota
ANTHONY BRINDISI, New York
JEFFERSON VAN DREW, New Jersey
JOSH HARDER, California
KIM SCHRIER, Washington
CHELLIE PINGREE, Maine
CHERI BUSTOS, Illinois
SEAN PATRICK MALONEY, New York
SALUD O. CARBAJAL, California
AL LAWSON, JR., Florida
TOM O'HALLERAN, Arizona
JIMMY PANETTA, California
ANN KIRKPATRICK, Arizona
CYNTHIA AXNE, Iowa

K. MICHAEL CONAWAY, Texas, *Ranking Minority Member*
GLENN THOMPSON, Pennsylvania
AUSTIN SCOTT, Georgia
ERIC A. "RICK" CRAWFORD, Arkansas
SCOTT DESJARLAIS, Tennessee
VICKY HARTZLER, Missouri
DOUG LAMALFA, California
RODNEY DAVIS, Illinois
TED S. YOHO, Florida
RICK W. ALLEN, Georgia
MIKE BOST, Illinois
DAVID ROUZER, North Carolina
RALPH LEE ABRAHAM, Louisiana
TRENT KELLY, Mississippi
JAMES COMER, Kentucky
ROGER W. MARSHALL, Kansas
DON BACON, Nebraska
NEAL P. DUNN, Florida
DUSTY JOHNSON, South Dakota
JAMES R. BAIRD, Indiana
JIM HAGEDORN, Minnesota

ANNE SIMMONS, *Staff Director*
MATTHEW S. SCHERTZ, *Minority Staff Director*

SUBCOMMITTEE ON BIOTECHNOLOGY, HORTICULTURE, AND RESEARCH

STACEY E. PLASKETT, Virgin Islands, *Chair*

ANTONIO DELGADO, New York
TJ COX, California
JOSH HARDER, California
ANTHONY BRINDISI, New York
JEFFERSON VAN DREW, New Jersey
KIM SCHRIER, Washington
CHELLIE PINGREE, Maine
SALUD O. CARBAJAL, California
JIMMY PANETTA, California
SEAN PATRICK MALONEY, New York
AL LAWSON, JR., Florida

NEAL P. DUNN, Florida *Ranking Minority Member*
GLENN THOMPSON, Pennsylvania
VICKY HARTZLER, Missouri
DOUG LAMALFA, California
RODNEY DAVIS, Illinois
TED S. YOHO, Florida
MIKE BOST, Illinois
JAMES COMER, Kentucky
JAMES R. BAIRD, Indiana

BRANDON HONEYCUTT, *Subcommittee Staff Director*

CONTENTS

	Page
Conaway, Hon. K. Michael, a Representative in Congress from Texas, opening statement	5
Dunn, Hon. Neal P., a Representative in Congress from Florida, opening statement	3
Submitted articles	49
Plaskett, Hon. Stacey E., a Delegate in Congress from Virgin Islands, opening statement	1
Prepared statement	2

WITNESSES

Pierson, Steve, Owner, Sar-Ben Farms Inc.; Board Director, CROPP (Cooperative Regions of Organic Producer Pools) Cooperative/Organic Valley, St. Paul, OR	6
Prepared statement	7
Huckaby, Jeff, President, Grimmway Enterprises, Inc./Cal-Organic Farms, Bakersfield, CA	10
Prepared statement	12
Supplementary material	73
Whalen, Benjamin, Co-Founder and Owner, Bumbleroot Organic Farm, Windham, ME	14
Prepared statement	15
Brin, Shelli D., Market Manager/Agritourism Manager, Ridge to Reef Farm; Farm Development Manager, Hideway Farm; Board Member, Virgin Islands Good Food Coalition; Member, VI Farmers Alliance, Frederiksted, St. Croix, VI	20
Prepared statement	21
Brown, Jeremy, Co-Founder, Broadview Agriculture, Inc.; Member, Executive Committee, Plains Cotton Growers, Inc.; Member, Board of Directors, Texas Organic Marketing Cooperative, Lamesa, TX	24
Prepared statement	26

REVIEWING THE STATE OF ORGANIC AGRICULTURE—PRODUCER PERSPECTIVES

WEDNESDAY, OCTOBER 30, 2019

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON BIOTECHNOLOGY, HORTICULTURE, AND RESEARCH,
COMMITTEE ON AGRICULTURE,
Washington, D.C.

The Subcommittee met, pursuant to other business, at 10:29 a.m., in Room 1300 of the Longworth House Office Building, Hon. Stacey E. Plaskett [Chair of the Subcommittee] presiding.

Members present: Representatives Plaskett, Delgado, Cox, Harder, Brindisi, Van Drew, Schrier, Pingree, Carbajal, Panetta, Lawson, Peterson (*ex officio*), Dunn, Hartzler, Davis, Yoho, Baird, and Conaway (*ex officio*).

Staff present: Kellie Adesina, Malikha Daniels, Brandon Honeycutt, Keith Jones, Patricia Straughn, Jeremy Witte, Dana Sandman, and Jennifer Yezak.

OPENING STATEMENT OF HON. STACEY E. PLASKETT, A DELEGATE IN CONGRESS FROM VIRGIN ISLANDS

The CHAIR. This hearing on the Subcommittee on Biotechnology, Horticulture, and Research entitled, *Reviewing the State of Organic Agriculture—Producer Perspectives,* will come to order.

I want to say good morning and thank you for joining us as we evaluate the state of organic agriculture from the producers' perspective.

In the past 20 years, the USDA Organic Seal has grown to become a label that customers actively seek in the grocery aisle. Changing consumer preferences has led to immense growth and development in the organic sector. What was once a small niche market has transformed into a $52 billion industry.

Just as we have seen a tremendous growth and development in organic market, domestic organic producers have evolved as well. Organic farmers and ranchers represent a range of scales and types of agricultural production, as well as a diverse range of rural and urban geographic regions. The producers here today are no exception to this diversity. We have producers from Oregon, Maine, California, Texas, and my own home district of the Virgin Islands. They represent a cross-section of the industry, covering dairy, commodities, and specialty crops. I would like to thank you all for being here to share your insights into the industry, and for taking time away from your farms.

Just like other sectors that experience tremendous growth and change, the organic industry's expansion has its challenges as well. Earlier this year, we held a hearing with Under Secretary Greg Ibach and Dr. Jennifer Tucker to discuss the effectiveness of USDA's National Organic Program. This hearing highlighted efforts to protect the domestic organic supply chain and to support organic farmers and ranchers through USDA programs. During our conversation with Under Secretary Ibach, this Subcommittee stressed the importance of maintaining the integrity of the organic industry and for USDA to be attentive to the needs of the industry. Our producers depend on strong consumer confidence and clear standards to ensure the longevity of their business and continued expansion of the organic sector.

The National Organic Program is a voluntary public-private partnership between the USDA and producers. As the Subcommittee with jurisdiction over NOP, we have a responsibility to ensure that USDA is fulfilling its commitment to organic producers as a key stakeholder in that partnership. This includes being responsive to the needs of this sector, and ensuring producers have access to resources and technical assistance they need to run a successful operation.

The 2018 Farm Bill included several provisions to encourage growth and innovation in the organic sector, including increased research funding for the Organic Agriculture Research and Extension Act, and the continued support for the Organic Certification Cost-Share Program, and the Organic Production and Market Data Initiatives. The farm bill also expanded USDA's authority to crack down on bad actors attempting to undermine consumer confidence through fraudulent organic imports. These are all steps in the right direction for the sector, but our work is not done.

In a struggling farm economy plagued by uncertain trade conditions, increasing input costs, turbulent weather patterns, and low commodity prices, our farmers and ranchers are looking to thriving markets with high premiums, like organic industry, to diversify their operations and increase profits. It is imperative that Congress and USDA continue to work together to support farmers, ranchers, and consumers who seek out the organic seal.

[The prepared statement of Ms. Plaskett follows:]

PREPARED STATEMENT OF HON. STACEY E. PLASKETT, A DELEGATE IN CONGRESS FROM VIRGIN ISLANDS

Good morning, and thank you for joining us as we evaluate the state of organic agriculture from a producer's perspective.

In the past 20 years, the USDA Organic Seal has grown to become a label that customers actively seek out in the grocery aisle. Changing consumer preferences have led to immense growth and development in the organic sector. What was once a small, niche market has since transformed into a $52 billion industry.

Just as we have seen tremendous growth and development in the organic market, domestic organic producers have evolved as well. Organic farmers and ranchers represent a vast array of scales and types of agricultural production, as well as a diverse range of rural and urban geographic regions.

The producers here today are no exception to this diversity. We have producers from Oregon, Maine, California, Texas and my home district of the Virgin Islands. They represent a cross-section of the industry covering dairy, commodities, and specialty crops. I would like to thank you all for being here to share your insights into the industry and for taking time to be away from your farms.

Just like other sectors that experience tremendous growth and change, the organic industry's expansion has not come without challenges. Earlier this year, we held a hearing with Under Secretary Greg Ibach and Dr. Jennifer Tucker to discuss the effectiveness of USDA's National Organic Program (NOP). This hearing highlighted efforts to protect the domestic organic supply chain and to support organic farmers and ranchers through USDA programs.

During our conversation with Under Secretary Ibach, this Subcommittee stressed the importance of maintaining the integrity of the organic industry and for USDA to be attentive to the needs of the industry. Our producers depend on strong consumer confidence and clear standards to ensure the longevity of their business and continued expansion of the organic sector.

The National Organic Program is a voluntary, public-private partnership between USDA and producers. As the Subcommittee with jurisdiction over the NOP, we have a responsibility to ensure that USDA is fulfilling its commitment to organic producers as a key stakeholder in that partnership. This includes being responsive to the needs of the sector and ensuring producers have access to the resources and technical assistance they need to run a successful operation.

The 2018 Farm Bill included several provisions to encourage growth and innovation in the organic sector, including increased research funding for the Organic Agriculture Research and Extension Act and continued support for the Organic Certification Cost-Share Program and the Organic Production and Market Data Initiatives. The farm bill also expanded USDA's authority to crack down on bad actors attempting to undermine consumer confidence through fraudulent organic imports. These are all steps in the right direction for the sector, but our work is not done.

In a struggling farm economy plagued by uncertain trade conditions, increasing input costs, turbulent weather patterns, and low commodity prices, our farmers and ranchers are looking to thriving markets with high premiums—like the organics industry—to diversify their operations and increase profits. It is imperative that Congress and USDA continue to work together to support farmers, ranchers, and consumers who seek out the organic seal.

We have heard from USDA leadership on this topic, but it is time for producers to have a say. I look forward to hearing today's testimony and to learning how we can best support the organic sector.

Now, I'd like to recognize the distinguished Ranking Member, Mr. Dunn of Florida, for any opening remarks he would like to make.

The CHAIR. Now, I would like to recognize the distinguished Ranking Member, Mr. Dunn of Florida, for any opening remarks he would like to make.

OPENING STATEMENT OF HON. NEAL P. DUNN, A REPRESENTATIVE IN CONGRESS FROM FLORIDA

Mr. DUNN. Thank you very much, Madam Chair, and good morning to you, and good morning to our panelists.

We meet today against a backdrop of tough times in agriculture. Whether it is sustained flooding, early winter storms, or market uncertainty, agricultural producers face unbelievable risks, and for organic farmers, ranchers, and dairymen, that risk is no different.

This is one of the reasons I am proud that we were able to complete the Farm Bill of 2018. I am proud that it was a historic piece of legislation for the organic sector. We enacted language to address fraudulent imports, including a robust import certification program, providing the National Organic Program with access to cross-border documentation systems that are administered by other Federal agencies, and providing the program with additional oversight certifying agents operating in foreign countries.

The farm bill also provided a significant increase in funding to the Organic Agriculture Research and Extension Initiative. Finally, I am glad that we were able to secure report language urging USDA and the National Organic Standards Board to adhere to the best science and technical assistance available when making recommendations.

In July, this Subcommittee received an update from USDA Under Secretary Greg Ibach on the National Organic Program and USDA's status implementing the 2018 Farm Bill. The organic industry can trust that they do have allies in both Under Secretary Ibach's and Deputy Administrator Jenny Tucker's offices. They are doing a great job.

At that hearing, I described several challenges that I believe threaten the legitimacy of the organic program, and frankly, the industry as a whole. One that I will highlight are some segments of the organic industry who think it is wise to disparage non-organic production practices. The National Organic Program has proven to be a great marketing tool for the ag community, but it is not the only tool. There are several ways that American farmers successfully differentiate their products to meet consumer demand. Furthermore, many of the organic producers also farm using conventional practices. We recognize organic production is an important tool that farmers use to earn a premium for their product, and I know that they, like all farmers, are proud of the product.

Finally, I want to thank each of our witnesses for taking your time to be here today. Please know that the time you spent preparing for, traveling to today's hearing, and being away from your families and businesses is not lost on us. We greatly appreciate your commitment to the industry, and providing this Committee with timely information to help us do our jobs, we are very grateful to you for that. I look forward to hearing from you.

Thank you very much, Madam Chair, I yield back.

The CHAIR. I recognize that Chairman Peterson is here. Thank you for attending this hearing as well.

I now recognize Ranking Member Conaway for any opening statements he may have.

Mr. CONAWAY. No statement. Thank you.

The CHAIR. Okay, thank you.

The Chair would request that other Members submit their opening statement for the record so the witnesses may begin their testimony and to ensure that there is ample time for questions.

I would like to welcome all of our witnesses, and thank you for being here today. At this time, I would like to introduce our first witness, Mr. Steve Pierson of CROPP Cooperative/Organic Valley, and he is from St. Paul, Oregon. Mr. Pierson is the owner of Sar-Ben Farms, Inc., and is a board director for CROPP Cooperative/Organic Valley. He and his family work together to manage a 900 acre dairy farm, which has been in the organic production since 2005. Mr. Pierson was reelected to CROPP Cooperative Board of Directors in April 2018 for a 3 year term.

Our second witness is Mr. Jeff Huckaby, President of Grimmway Farms of Bakersfield, California. I know that Mr. Cox, who is a Member of this Committee, is very happy to have you here. Mr. Huckaby is a fourth-generation farmer who was born and raised in California's San Joaquin Valley, where he grew up helping on his grandfather's farm. He joined Grimmway Farms in 1998, and was most recently promoted to President of the company in 2016.

Our third witness is Mr. Ben Whalen of Bumbleroot Organic Farm in Windham, Maine. I recognize the gentlewoman from Maine, Ms. Pingree, to introduce Mr. Whalen.

Ms. PINGREE. Thank you very much, Madam Chair, and thank you so much for hosting this hearing this morning. Thank you to all of the witnesses. As was said earlier, we know you come from a long ways away and you are taking a day away from your family and your businesses and your farms, and that is busy, so thank you for doing that.

I am really excited to have Ben Whalen from Bumbleroot Farm in Windham, Maine, here. We are always excited to have a Mainer in the room, but we are particularly happy to have Ben. He is a good representation of the wonderful resurgence of young farmers who are in Maine, coming to Maine, and are there to practice farming sustainably.

Bumbleroot Farm is a small organic vegetable and flower farm. They sell directly to consumers at farmers' markets through a CSA, as well as local restaurants and caterers. Ben and his business partners are not just successful farmers, they are active participants in important conversations happening at the local, state, and Federal levels around climate change, around the challenges for young farmers, and about organic agriculture.

Ben, we really appreciate you taking time away from the farm, and wish you and all of your business partners the best of luck. Thank you.

The CHAIR. Thank you.

The fourth witness is Ms. Shelli Brin of Ridge to Reef Farm in Frederiksted, St. Croix. She is also working on a project now in St. Thomas. Ms. Brin is a farmer with Ridge to Reef Farm, the only certified organic farm in the U.S. Virgin Islands. Ms. Brin is a multigenerational Virgin Islander who has managed various operations on her farm for 10 years, including production of over 100 varieties of organic fruits and vegetables.

I would also welcome Mr. Jeremy Brown of Broadview Agriculture in Lubbock, Texas. He will be introduced by the full Committee Ranking Member, Mr. Conaway.

OPENING STATEMENT OF HON. K. MICHAEL CONAWAY, A REPRESENTATIVE IN CONGRESS FROM TEXAS

Mr. CONAWAY. Thank you, Madam Chair, and Mr. Huckaby, I believe I visited your farm last year. You hosted us, and thank you very much. Carrots are great.

Jeremy Brown, it is a pleasure to introduce him. He is a cotton producer from the great State of Texas, just to irritate Mr. Baird. Mr. Brown farms both organic and conventional cotton, wheat, rye, corn, and grain sorghum. Mr. Brown has a bachelor's degree in agriculture communications from Texas Tech University, and currently farms in Dawson County, which is located in the district I get to represent. Not only is Mr. Brown a great representative for agriculture in west Texas, but he also serves as one of the faces of farming and ranching for the U.S. Farmers and Ranchers Alliance. Mr. Brown, it is a great honor to have you with us today, and I am looking forward to your testimony. Jeremy, thank you for being here, buddy.

I yield back.

The CHAIR. Thank you.

We will now proceed to hearing from our witnesses. Each of you will have 5 minutes to present your testimony. That is more time than Members get on the floor, so use it wisely. When the light turns yellow, that indicates that there is 1 minute left to complete your testimony.

Mr. Pierson, please begin when you are ready.

STATEMENT OF STEVE PIERSON, OWNER, SAR-BEN FARMS INC.; BOARD DIRECTOR, CROPP (COOPERATIVE REGIONS OF ORGANIC PRODUCER POOLS) COOPERATIVE/ORGANIC VALLEY, ST. PAUL, OR

Mr. PIERSON. Well good morning, Chair Stacey Plaskett and other Members of the Subcommittee. As Ms. Plaskett mentioned earlier, my family and I operate a 900 acre dairy farm near St. Paul, Oregon. We milk 300 cows and care for about 800 total animals on the farm.

We became certified organic in 2005 and ship milk with Organic Valley. The farm provides a livelihood for our four farm families and three generations.

I did not come from an agricultural background. In fact, I never even stepped on a dairy farm until I started working on the farm at the University of Florida where I received a degree. But as a young adult, I saw dairy farming as a profession that would allow me a great place to raise a family and work with my hands and heart. Becoming an organic dairy farmer has amazingly brought those aspirations to reality for me and the next generation.

I also have the privilege of serving on the Board of Directors of Organic Valley, the largest organic co-op in the world. Organic Valley was established in 1988 and has grown to include nearly 2,000 farmers in 34 states. The majority of the co-op's business is dairy, and we offer an array of products available to tens of thousands of retail locations across the United States and internationally. In addition to dairy, we have a couple of hundred producers that focus on organic eggs, produce, meat, and feedstuffs. Our cooperative has about 900 employees and estimated $104 million in fixed assets and about $1.1 billion in annual sales.

Profitability has been hard to obtain on either the farm or the cooperative business side. Margins are thin, and while our pay price remains around $29 a hundredweight, we are practicing a quota system to manage the amount of milk the co-op receives.

The challenges in organic dairy, I believe, can be attributed to the following: changes in consumer preferences to favor more full fat dairy products have made utilization of farm milk more difficult; increased milk production and competition has created an imbalance in supply and demand; trade disputes are causing a lost market opportunity; and there is regulatory uncertainty in the organic standards. A specific challenge that must be resolved is inconsistent interpretation of the organic standard for what is called the origin of livestock. This centers around the requirements of farms transitioning dairy cattle to organic. Most farms that come in to organic dairy abide by the one time 12 month transition allowance for a dairy herd. Thereafter, they source only organic-born and organic-raised replacements, and this is the interpretation most certifiers recognize.

Yet, some certifiers and their dairy clients practice a continuous transition approach, which exploits the 12 month allowance, using it multiple times, or instead, they source replacement stock from operations who specialize in transitioning conventional animals.

When comparing these two approaches, our analysis at Organic Valley reveals at least a $600 cost advantage per replacement animal. A farm my size ends up with a competitive disadvantage of nearly $45,000 per year because of this differential. The USDA needs to fix this problem and as of October 1, they reopened the comment period for the 2015 origin of livestock proposed rule. This proposed rule clarifies dairy transition as a one time event on a dairy farm associated with a producer. My strong message to the Committee Members today is to continue demanding that the USDA finalize the origin of livestock language in a manner that aligns closely with the proposed rule.

Another couple of hot button issues in organic dairy is ensuring grazing is done and organic feedstuffs from international sources is authentic. I support the Dairy Compliance Project and the strengthening enforcement rulemaking that is approved and going ahead in the USDA.

What are some of the challenges facing us in the organic dairy marketplace right now, and what am I encouraged about?

I know that organic dairy farmers are committed to the land, their cows, and the cooperative. We already know that organic dairy can provide a positive impact on the environment and climate, and we have been doing regenerative soil health and grazing practices for decades, and these practices are fundamental to our ag system.

We in organic have seen scientific third-party studies in organic milk affirming thorough testing that organic milk is a clean and healthy option for consumers and void of pesticides and antibiotic residue, and as far as dairy innovation, we are seeing how new products, like Organic Valley Ultra, the first organic ultra-filtered milk with twice the protein and half the sugar, hitting the marketplace.

We at Organic Valley have evolved our thinking to recognize that consumers are making a statement about who they are by what is in their grocery carts and homes, and defining themselves by electing to choose organic and Organic Valley products. It is a matter resonating with consumers and having products available for them to purchase.

Thank you for this opportunity to share my experiences and thoughts, and I welcome any follow-up questions. Thank you.

[The prepared statement of Mr. Pierson follows:]

PREPARED STATEMENT OF STEVE PIERSON, OWNER, SAR-BEN FARMS INC.; BOARD DIRECTOR, CROPP (COOPERATIVE REGIONS OF ORGANIC PRODUCER POOLS) COOPERATIVE/ORGANIC VALLEY, ST. PAUL, OR

Good morning, Chair Stacy Plaskett, Ranking Member Neal Dunn, as well as the other Members of the Subcommittee. Thank you for the opportunity to testify about the opportunities and challenges in the organic dairy marketplace.

My family and I operate a 900 acre dairy farm near St. Paul, Oregon. We milk 300 cows daily and care for a total of 800 dairy animals on the farm.

We became certified organic in 2005 and ship milk with CROPP Cooperative, which is more commonly known by its brand Organic Valley. Our farm provides a

livelihood for my wife Susan and I, as well as my three adult children and my in-laws.

That is an important point to emphasize: This dairy farm supports four families as their sole income, as well as five other non-family employees.

I did not come from an agriculture background, but as young adult I saw dairy farming, perhaps naively and with some romanticism, as a profession that would allow me a great place to raise a family and work with my hands and heart. Becoming an organic dairy farmer, and joining with other organic dairy farmers in a cooperative, has amazingly brought those aspirations to reality.

Becoming an organic dairy farm has allowed us to make significant capital and sustainability investments to the farm. This past year we built a new rotary parlor to increase farm efficiencies. In 2014, we purchased a hay ranch in central Oregon. And in 2015 we added renewable energy infrastructure to the operation. We are in it for the long haul and building a farm that will be viable for the next generation if they too want to pursue this profession.

Organic Valley

I also have the privilege of serving as a Board Director for CROPP Cooperative, also known as Organic Valley.

Organic Valley was established in 1988 with seven founding farmers and, since then, has grown into America's largest cooperative of certified organic farmers, with nearly 2,000 farms in 34 U.S. states, as well as in Canada, Australia and the United Kingdom. In 2018, the business achieved $1.1 billion in sales.

The cooperative's founding purpose was *to create and operate a marketing cooperative that promotes regional farm diversity and economic stability through organic agricultural methods and the sale of certified organic products.*

The majority of the co-op's business is dairy. We offer an array of products available in approximately 15,000 retail locations across the United States. Our cooperative also sells organic bulk milk and ingredients to customers who use it in their own products, many of which are also distributed nationally.

In addition to dairy, the co-op includes a couple hundred producers who focus on organic eggs, produce, meat, and feedstuffs.

My cooperative has about 900 employees and an estimated $104 million in fixed assets. The assets include a mix of processing facilities, office buildings, and warehouses located on four different campuses. The most recent facility purchase, in 2017, I'm proud to say, is a creamery in McMinnville, Oregon, just 20 miles from our farm. While the cooperative does some dairy processing at this facility in McMinnville as well as a creamery in Chaseburg, Wisconsin, it primarily relies on as many as 90 co-processors across the country to bring our products to market.

As a Board Director, I am proud that the cooperative has made these intentional investments in rural communities in an effort to create jobs and economic stability. It's an extension of the co-op's founding mission and not something you see every agricultural-based business prioritize.

Dairy Market

These past years have been a difficult time in organic dairy.

Profitability has been hard to obtain on either the farm or the cooperative business side. Margins are thin, and while our national pay price remains around $29 a hundredweight, we are practicing a quota system to manage the amount of milk the co-op receives.

The challenges in organic dairy, I believe, can be attributed to the following:

1. Changes in consumer preferences to favor more full-fat dairy products have made utilization of farm milk more difficult.
2. Increased milk production and competition in organic dairy has created an imbalance in supply and demand.
3. Trade disputes have caused an inability to sustain and grow international markets.
4. And regulatory uncertainty in the organic standards

Origin of Livestock

A specific challenge that must be resolved is inconsistent interpretation of the organic standard for what is called the origin of livestock. This centers around certifiers failing to align on the requirements for transitioning dairy cattle to organic status.

Most farms that come to organic dairy abide by a one time 12 month transition allowance for a dairy herd. Thereafter, farmers source only organic-born and or-

ganic-raised replacements. This is the interpretation of the regulation which most certifiers agree with.

Yet, some certifiers and their dairy clients, practice a continuous transition approach which exploits the 12 month allowance, using it multiple times and with multiple groups of animals, or alternatively sources replacement stock from operations that specialize in transitioning animals year after year from conventional sources.

When comparing these two approaches our analysis at Organic Valley reveals a $600 cost differential per replacement animal.

If you assume the national cull rate, which is around 25 percent, a farm of my size ends up at a competitive disadvantage of nearly $45,000 per year because of this differential.

USDA has not fixed this problem, but as of October 1, 2019, they have reopened the comment period for the 2015 Origin of Livestock Proposed Rule. The proposed rule fixed this dilemma by clarifying dairy transitions to be understood as a one time event on a dairy farm associated with a producer.

I believe the July 17, 2019, hearing in front of this Subcommittee titled "Hearing on Assessing the Effectiveness of the National Organic Program," where this issue came up in exchanges with Undersecretary Greg Ibach, was one of the motivating forces that got USDA to prioritize this topic and advance regulatory action on it. Thank you.

My strong message to the Committee Members today is to continue demanding that USDA finalize the origin of livestock language in a manner that aligns closely to the proposed rule. My interactions with fellow organic dairy farmers and organic dairy associations lead me to believe there is a strong consensus to fix this regulatory failing.

Dairy Compliance Project, Strengthening Enforcement, International Trade

Two additional hot-button issues in organic dairy include ensuring grazing is done in accordance with the Pasture Rule, and that organic feedstuffs from international sources are authentic.

I'm encouraged that the National Organic Program is continuing to implement the Dairy Compliance Project, which spot-checks organic dairies and certifiers with AMS auditors to examine how the organic standards are being achieved on the ground.

While this is a welcome oversight effort, it is our experience at Organic Valley that the agency has been fairly guarded about the approach and findings of the Dairy Compliance Project. All of us want organic dairy to be at the top of its game, and we believe sharing information and soliciting feedback from organic dairy stakeholders can enhance the agency's work in this area.

I am also pleased that Federal rulemaking on Strengthening Enforcement is to be coming yet this year. This rulemaking focuses on addressing the risk of fraudulent organic grain imports and was initiated in the last farm bill.

Organic Valley strongly endorsed Congressional action on these issues, and we are supportive of both private-led and agency-initiated efforts to ensure organic integrity through organic supply chains.

Additionally, Organic Valley's grower pool, which raises animal feedstuffs, has been alarmed by the fact that fraudulent imports can have a harmful effect on domestic organic crop prices. Our members worry that domestic growers are put at a competitive disadvantage on the world stage if entities in other countries are engaging in criminal activity to misrepresent or sell non-organic grains as USDA Certified Organic.

The Strengthening Enforcement rulemaking cannot come soon enough, and I urge the Subcommittee to stay in contact with the National Organic Program to safeguard the rulemaking advances in concert with the urgency reflected in the 2018 Farm Bill.

In the international trade arena, organic dairy—along with all of the nation's dairy—faces, a seesaw of trade disputes that have created disruptions in planning and sales efforts in foreign markets like China, the European Union, the United Kingdom, and beyond.

Organic Valley's experiences have been that organic dairy products are particularly sensitive to additional tariffs, given they are already considered a high-premium product in many foreign markets. A marginal increase in consumer prices for both branded and private label organic products, to offset the imposition of tariffs, has made these organic offerings untenable in most cases.

For Organic Valley, it's not just the loss of millions of dollars in sales opportunities this year, but also the inability to recoup market research that has spanned 7 years.

There needs to be a speedy resolution to trade disputes, and I urge Congress to be more present in bringing an end to these uncertainties and lost market opportunities.

Opportunities

So, that is some of what is challenging us in the organic dairy marketplace right now. But what am I'm encouraged about?

I know our organic dairy farmers are committed to the land, their cows, and their cooperative. I am encouraged that organic dairy is special in what we offer, and that comes from the way we raise and treat our animals. And I am encouraged that dairy innovation has the potential to help utilize milk and offer choices for consumers.

We in organic already know organic dairy can have a positive impact on the environment and climate. Organic dairy farmers have been doing regenerative soil health and grazing practices for decades—these practices are fundamental to our agriculture systems.

We in organic have seen scientific studies on organic milk, like the one done by Emory University in 2019, affirming through testing that organic milk is a clean and healthy option for consumers void of toxic pesticide and antibiotic residues.

And in dairy innovation, we are seeing new products like Organic Valley Ultra, the first organic ultra-filtered milk, made using a unique filtration process to create an organic milk with twice as much protein and half the sugar.

In closing, we at Organic Valley have evolved our thinking to recognize that consumers are making a statement about who they are by what's in their grocery carts and homes, defining themselves by electing to choose organic and Organic Valley products. It is a matter of resonating with the values consumers have and finding the places and delivery that gets them what they want. Organic is a choice for a farmer, a choice for a business, and a choice for a consumer. I've been blessed to be able to be an organic farmer and work with an organic marketing cooperative to bring from the farm to consumers a product that has high integrity and promise.

Thank you for this opportunity to share my experiences and thoughts. I welcome any follow-up questions that can inform the Subcommittee as you deliberate on future food and agriculture policy.

The CHAIR. Thank you.

Mr. Huckaby, please proceed with your testimony.

STATEMENT OF JEFF HUCKABY, PRESIDENT, GRIMMWAY ENTERPRISES, INC./CAL-ORGANIC FARMS, BAKERSFIELD, CA

Mr. HUCKABY. Thank you, Chair Plaskett, Ranking Member Dunn, and distinguished Members of the Subcommittee for the opportunity to testify today.

My name is Jeff Huckaby, and I am the President of Grimmway Farms, Cal-Organic, based in Bakersfield, California. I am a fourth-generation farmer, born and raised in the San Joaquin Valley. I started helping my grandfather at age 11 riding the back of a carrot planter. Forty-two years later, I oversee the largest carrot company in the world and the largest organic vegetable company in the nation. Our company's organic roots tie back to 1984 when Cal-Organic started with ¼ acre of lettuce. Today, we grow over 65 different items on 45,000 acres of prime organically certified ground throughout California, Arizona, Oregon, Washington, Colorado, Georgia, and Florida. We are proud that 100 percent of our produce is grown in the United States.

Brothers Rod and Bob Grimm started with a roadside stand in Anaheim, California, and formed Grimmway Farms in 1969. Moving the operations to Bakersfield in 1981, Grimmway went on to market packaged baby carrots as the fresh produce industry was

rapidly changing. Grimmway celebrates its 50th anniversary this year, and now grows over 40,000 acres of carrots.

In 2001, Grimmway acquired Cal-Organic Farms. Their vision was to make certified organic vegetables easily accessible to customers. We are now the sole supplier to Costco for baby carrots, transitioning 100 percent of their carrots sold in their stores to certified organic. We are proud to be the leading supplier of organic vegetables to most major retailers throughout the nation.

Today, we continue to demonstrate that high quality organic produce can be grown at a large scale, while still utilizing best practices in sustainable agriculture, improving soil health, and protecting the land for future generations. In order to become certified organic, the law requires the use of production practices that advance sustainability in agriculture like crop rotation, cover cropping, and maintaining and improving soil health, conserving biodiversity, and reducing nutrient pollution. A farmer must grow and sustain high yields without the use of most synthetic chemicals and fertilizers.

For us, carrots are our biggest crop. We discovered early on that crop rotation was essential when converting to organic land. Carrots are grown in the same soil once every 3 years, and crops grown during the off years are critical. Proper rotation, composting, and cover cropping significantly improved our soil health. As the soil improved, so did our crop quality and tonnage, and today, our organic yields routinely outperform our conventional crops.

We recently expanded our operation to Georgia and Florida. We started our first organic harvest in this region this week, consisting of over ten organic items which will help support the Southeast marketplace. This type of growth is necessary to meet growing consumer demand. In the fresh produce category, quality is everything, and consumers are desiring both variety and year-round availability.

The USDA organic label is the most highly regulated and transparent food system in the world. Even with the stringent requirements in place to be certified organic, we strive to continuously improve operations to achieve the best possible outcomes.

Organic is a voluntary regulatory program for those who choose to meet Federal standards and market their products under the USDA Organic Seal. This label is widely trusted by consumers, with over 82 percent of households across the U.S. now purchasing organic products.

Organic farmers are unique in that they rely on the Federal Government to develop and maintain strong regulations for the organic sector. In order to maintain a healthy marketplace, organic farmers, businesses, and consumers require a strong Federal organic program at USDA. The Federal Government must move rapidly to implement standards that farmers and the industry recommend through the National Organic Standards Board. The future of organic will depend on the Federal Government keeping pace with the marketplace. Organic regulations must be meaningful and strong. We need the support of Congress to ensure that USDA not only has the resources to maintain, enforce, and develop organic standards, but also to provide oversight and accountability when the regulatory process fails to move the standards forward.

In order to continue to provide choices for consumers and economic opportunities for farmers, the public-private partnership between USDA and the organic industry must continue to grow. Organics is a bright spot in U.S. agriculture, with a tremendous opportunity to change the future of our food system. As consumers become increasingly interested in sustainable food production, nutrition, and quality, organic farming can provide a path forward to improve the state of agriculture in the U.S.

Thank you.

[The prepared statement of Mr. Huckaby follows:]

PREPARED STATEMENT OF JEFF HUCKABY, PRESIDENT, GRIMMWAY ENTERPRISES, INC./CAL-ORGANIC FARMS, BAKERSFIELD, CA

Thank you, Chair Plaskett, Ranking Member Dunn, and distinguished Members of the Subcommittee for the opportunity to testify today. My name is Jeff Huckaby and I am President of Grimmway Farms/Cal-Organic based in Bakersfield, California. I am a fourth-generation farmer born and raised in the southern end of the fertile San Joaquin Valley, also known as the Central Valley. I started helping my grandfather at the age of eleven, riding the back of a carrot planter. Forty-two years later, I oversee the largest carrot company in the world and the largest organic vegetable company in the nation. Our company has organic roots tied back to 1984 when Cal-Organic started production with ¼ acre of lettuce. Today, we grow over 65 items on over 45,000 acres of prime certified organic ground throughout California, Arizona, Oregon, Washington, Colorado, Georgia, and Florida. We are proud that 100% of our produce is grown in the United States.

Long before the formation of Cal-Organic, brothers Rod and Bob Grimm started with a simple roadside vegetable stand in Anaheim, California, and formed Grimmway Farms in 1969. Having moved the operation to Bakersfield in 1981, Grimmway went on to market packaged baby carrots as the fresh produce industry was rapidly changing. Grimmway, which just celebrated its 50th anniversary, now grows over 65 vegetables including over 40,000 acres of carrots.

In 2001, Grimmway set out to change the produce landscape once again by acquiring Cal-Organic Farms, a pioneer organic vegetable company. Their vision was to make certified organic vegetables accessible to as many consumers as possible. We are the sole supplier to Costco for baby carrots, and have worked with this leading retailer to transition 100% of the carrots sold in their stores to certified organic. We are also the leading supplier of organic vegetables to most of the major retailers throughout the nation.

Earlier this year, we expanded our operation to Georgia and Florida with the acquisition of Generation Farms in Lake Park, Georgia. Incidentally, this week we started our first organic harvest in this region consisting of over ten organic vegetables which that will help support the local Southeast marketplace. While the climate in the Southeast is significantly different than California, we are finding ways to produce high-quality organic vegetables.

Today, Grimmway Farms and Cal-Organic continue to demonstrate that high-quality, nutritious organic produce can be grown at a large scale to meet consumer demand while still utilizing best practices in sustainable agriculture, improving soil health, and protecting the land for future generations.

The Benefits of USDA Certified Organic

To become certified organic, the law requires the use of production practices that advance sustainability in agriculture such as crop rotation, cover cropping, maintaining and improving soil health, conserving biodiversity, and reducing nutrient pollution. A farmer must be able to grow and sustain high yields without the use of most synthetic chemicals and fertilizers. Organic farming is truly a holistic approach.

At Cal-Organic, we strive to continuously improve our practices to ensure that we have the healthiest soil possible. We have invested in water banking projects to conserve and bank water during years of surplus to help offset years of drought. We also produce renewable energy through solar panels to help power our facilities.

At Grimmway and Cal-Organic, carrots are our biggest crop. We discovered early on that crop rotation was extremely important when it comes to converting organic land. Carrots are grown in the same soil once every 3 years, and the crops grown

during the off years (years 2 and 3) are crucial. Proper rotation, composting, and cover cropping significantly improved our soil health.

As our soil health improved, so did our crop quality and tonnage. Today, our organic yields routinely outperform our conventional crops. Lessons learned through production at Cal-Organic have shown us ways we can improve our conventional operations at Grimmway Farms.

State of the Organic Produce Sector: Challenges and Opportunities

Organic has grown rapidly over the past 2 decades, from an $8 billion-a-year industry when USDA issued the national organic standards in 2002 to over $52 billion today. Overall growth in the organic marketplace is rapidly increasing as consumers seek more nutritious, quality food. When consumers purchase organic for the first time, their journey typically begins in the produce aisle. Organic produce has been and remains the leading category in organic food with over $17 billion in annual sales, nearly 40% of the total $50+ billion market for organic. Fifteen percent of all fresh produce sold in the United States is certified organic. California alone grows over 85% of certified organic specialty crops.

While organic produce previously enjoyed rapid double-digit growth, it leveled off to a healthy growth rate of 5.6% in 2018. That is still much higher than the growth rate of the overall produce market at 1.7% last year. Despite this impressive growth, there are still unique challenges in the organic fresh produce market. When dealing with a highly perishable product, challenges like food safety, labor, and distribution become even more critical.

In the fresh produce category, quality is everything. Consumers are looking for high-quality produce and desire variety and year-round availability. As more Americans incorporate fresh produce into their diets, an opportunity exists for farmers who are willing to think outside the box. I never thought I would be working on a farm that sells over 65 different vegetables to retailers. At Cal-Organic, we must market the entire diversity of our crop rotation, not just the few crops that are best sellers such as carrots.

Continuous Improvement Is the Cornerstone of Organic Farming

The USDA Organic label is the most highly regulated and transparent food system in the world. Even with the stringent requirements that must be met to be certified organic, Cal-Organic and many other farmers strive to continuously improve their operations to achieve the best possible outcomes that sustainable agricultural practices can deliver.

Organic is a voluntary regulatory program for producers and handlers who choose to meet a strict Federal standard and market their products under the USDA Organic Seal. This label is widely trusted by consumers, with over 82% of households across the United States now purchasing organic products.

Organic farmers and businesses are unique in that they rely on the Federal Government to develop and maintain strong regulations for the organic sector. The public-private partnership between the organic industry and USDA is a process that must embody continuous improvement and evolution of the organic standards to meet consumer expectations.

To maintain a healthy marketplace, organic farmers, businesses, and consumers require a strong Federal organic program at USDA that can keep pace with innovations taking place in the sector. The Federal Government must move rapidly to implement standards that farmers and the industry recommend through the National Organic Standards Board (NOSB). NOSB is the Federal advisory committee established in the Organic Foods Production Act that makes recommendations to USDA on organic standards development.

The future of organic will depend on the Federal Government keeping pace with the marketplace. Organic regulations must be meaningful and strong. This requires USDA and Congress to treat organic standards differently than they would mandatory regulations. We need the support of Congress to ensure USDA not only has the resources to maintain, enforce, and develop organic standards, but also to provide oversight and accountability when the regulatory process fails to move forward the standards demanded by the organic sector.

To continue to provide choices for consumers and economic opportunities for farmers, the public-private partnership between USDA and the organic industry must continue to grow.

Conclusion

Organic is a bright spot in U.S. agriculture with tremendous opportunity to change the future of our food system. As consumers become increasingly interested in sustainable food production, nutrition and quality, organic farming can provide a path forward to improve the state of agriculture in the U.S.

The CHAIR. Thank you.

Mr. Whalen, when you are ready, please begin.

STATEMENT OF BENJAMIN WHALEN, CO-FOUNDER AND OWNER, BUMBLEROOT ORGANIC FARM, WINDHAM, ME

Mr. WHALEN. Good morning, Chair Plaskett, Ranking Member Dunn, and Members of the Subcommittee. Thank you for giving me the opportunity to testify and share a young farmer's perspective on the state of organic agriculture.

I believe it is incredibly important for farmers to be included in the conversation surrounding organic standards, and I appreciate this opportunity to share my experience as a small organic grower.

My name is Ben Whalen. I am 32 years old and have owned and operated Bumbleroot Organic Farm for 5 years with my wife, Melissa, and our business partners, Jeff and Abby Fisher. Bumbleroot is a small organic vegetable and flower farm located in Windham, Maine, just 20 minutes west of Portland, on the edge of suburban development and rural farmland.

Agriculture has always been a huge part of Maine's identity, and small organic farms like mine contribute to the strength of Maine's food economy. According to the 2017 Agricultural Census, there are 7,600 farms in Maine, and nearly ⅔ of them are less than 100 acres: 535 Maine farms are certified organic.

Our property is 90 acres of rolling hills, and we grow a diversity of certified organic vegetables, flowers, and herbs on just 7 of those acres. We provide weekly farm shares to 125 families through our CSA program, attend three weekly farmers' markets, and work closely with 20 restaurants and caterers in the Portland area. We employee three full-time staff in addition to the owners, and hire three part-time workers in the summer months.

The growth of our business has been greatly supported by the strength of Maine's organic farming community, as well as numerous Federal programs. We participated in Maine Organic Farmers and Gardeners Association's Beginning Farmer Training Programs that are directly funded by BFRDP. Every year we are in business, the OCCSP has reimbursed us up to 75 percent of fees associated with organic certification. And this week, we are waiting for a sunny day to pull plastic on our fifth high tunnel. We have received grants for all these high tunnels through NRCS's EQIP and AMA Programs. These tunnels have allowed us to extend our growing season into Maine's cold winter months, and provide income for our families and food for our communities year-round.

As organic farmers, we believe that soil health is the foundation of our farm and our business. By building healthy soils, we increase biodiversity, grow nutrient-dense crops, decrease erosion, and sequester carbon. The term that is being used more often by our peers is *regenerative agriculture.* The philosophies and principles of regenerative agriculture ask farmers to take a step beyond simply maintaining sustainable systems and to implement practices that regenerate the land and increase soil health. These practices maximize carbon sequestration while minimizing the loss of that carbon once it is stored in the soil.

Many of the practices used in regenerative agriculture are already best practices under national organic standards. Use of cover

crops, crop rotation, and compost all highlight the importance of soil fertility. Reducing and eliminating tillage, which disrupts the biodiversity in soil, can help maintain soil carbon once it is stored. Healthier soils yield healthier food, which in turn creates healthier communities.

Climate change is one of the greatest challenges our farm business will face in the coming decades. Organic and regenerative agriculture must be part of the solution to mitigating and adapting to climate change. Research into how farms can effectively sequester carbon in our soils and how to protect that carbon once it is stored can help build resilient farm businesses and create more sustainable food systems. For this reason, continued investment into organic research programs like OREI and ORG is vital.

I represent the next generation of farmers in our country, and without continued and increased support from Federal programs, the future of our food system is at risk. One of the major challenges young and beginning farmers are facing is access to affordable farmland. Secure land tenure is fundamental to farm viability. Without secure tenure, farmers are unable to invest in on-farm infrastructure and conservation practices critical to building soil quality, financial equity in their businesses. We were incredibly lucky to find our forever farm through work with Maine Farmland Trust, a farmland protection agency in Maine, but we have seen many of our peers close their farm businesses because they were unable to find affordable farmland.

With the ever-increasing cost of land, competition from development, and many farmers reaching retirement age with no succession plan in place, we need to increase funding for farmland protection through ACEP–ALE. According to 2017 Agricultural Census, between 2012 and 2017, over 146,000 acres of farmland were lost in Maine alone.

Greater farmland protection, coupled with transitioning farm businesses towards organic and regenerative practices will allow our agriculture industry to lead the way, and combating climate change while providing the healthiest possible food for our communities. The future of food in our country has to include more organic farms, and we need the government's support. By incentivizing growers to transition to organic and regenerative practices, we can build more vibrant, resilient food systems in our local communities and our country as a whole.

Once again, I would like to thank the Subcommittee for giving me the opportunity to testify today on the state of organic agriculture. I am happy to answer any questions you may have.

[The prepared statement of Mr. Whalen follows:]

PREPARED STATEMENT OF BENJAMIN WHALEN, CO-FOUNDER AND OWNER, BUMBLEROOT ORGANIC FARM, WINDHAM, ME

Good morning, Chair Plaskett, Ranking Member Dunn, and Members of the Subcommittee. Thank you for the opportunity to testify and to share a young farmer's perspective on the state of organic agriculture.

My name is Ben Whalen. I'm thirty-two years old and have owned and operated Bumbleroot Organic Farm for 5 years with my wife, Melissa, and our business partners, Jeff and Abby Fisher. Bumbleroot is a small organic vegetable and flower farm located in Windham, Maine, just twenty minutes west of Portland, on the edge of suburban development and rural farmland.

Being an organic farmer in Maine is synonymous with being a small family farm. Our property is ninety acres of rolling pasture, fields, and forest, and we grow a diversity of certified organic vegetables, flowers, and herbs on just 7 of those acres. We provide food for 125 families through our CSA program, attend three weekly farmers' markets, and work closely with twenty restaurants and caterers in the Portland area. We employ three full-time staff in addition to the owners and hire three part-time workers in the summer months.

Though our farm is unique in many ways, our scale of operation is not. According the 2017 Agricultural Census, of the 7,600 farms in Maine, nearly ⅔ of them are less than 100 acres. 535 Maine farms are certified organic. At Bumbleroot, our production practices rely on a combination of manual hand labor and small tractors—much of our seeding, planting, weeding, and harvesting is done by hand while field preparation and cultivation is done by tractor.

As organic farmers, we believe that soil health is the most important consideration for all aspects of our farm. By building healthy soils we can increase biodiversity, grow healthier crops, decrease erosion, and sequester carbon. A term that is being used more often in our area, and across the country, is **regenerative agriculture.** The philosophy and principles of regenerative agriculture ask farmers to take a step beyond simply maintaining sustainable systems and to implement practices that regenerate the land and build soil health. These practices maximize carbon sequestration while minimizing the loss of that carbon once it is stored in the soil. Many of the practices used in regenerative agriculture are already best practices under the National Organic Standards: use of cover crops, crop rotations, and compost highlight the importance of soil fertility. Reducing and eliminating tillage, which destroys the biodiversity of the soil, can help maintain soil carbon once it is stored—this seems to be a trend in the regenerative agriculture movement.

We view climate change as one of the greatest challenges our farm business will face over the coming decades. Organic and regenerative agriculture must be part of the solution to mitigating and adapting to climate change. Research into how farms can more effectively sequester carbon in our soils, and how to protect that carbon once it is stored, can build more resilient farm businesses and create more sustainable food systems. For this reason, continued investment into organic research programs like Organic Agriculture Research and Extension Initiative (OREI) and Organic Transitions Program (ORG) are so important. I thank the Committee for a 2018 Farm Bill which ramps up funding for OREI to $50 million in permanent baseline funding by 2023. However, the recent relocation of NIFA will lead to significant delays in grant funding for these programs, putting at risk important organic research. Farmers cannot afford delays in research nor can we afford to fall behind the rest of the world. The relocation hurts organic research, farmers and U.S. agriculture. I urge this Committee to work with your colleagues on agriculture appropriations to help defend the House bill's position to prohibit the relocation.

Another major challenge young and beginning farmers are facing is access to affordable farmland. Secure land tenure is fundamental to farm viability. Without secure land tenure, farmers are unable to invest in on-farm infrastructure and conservation practices critical to building soil quality, financial equity, and their businesses. Our farm was incredibly lucky to find our forever farm through working with Maine Farmland Trust, a farmland protection agency in Maine. But we've seen many of our peers close their farm businesses because they were unable to find long-term land. With the ever increasing cost of land, we need to increase funding for farmland protection. According to the 2017 Farm Census, between 2012 and 2017 over 146,000 acres of farmland were lost in Maine alone. Farmland conservation not only ensures space for future generations to grow food for their communities, it also has a direct impact on reducing the potential carbon emissions associated with development. Greater farmland protection coupled with transitioning farm businesses towards regenerative farm practices will allow our agriculture industry to lead the way in combating climate change while providing the healthiest possible food to our communities.

The scale of the work needed to be done to combat climate change is enormous. No one person, farm, or industry will be able to reverse the damage that has already been done over the last century. But by re-imagining our food systems to reintegrate small scale, organic farms that use regenerative practices, we can build vibrant, resilient, localized food systems that better serve our communities, strengthen our regional economies, and

Soil Health

Soil is the soul of a vegetable farm. When I first got into farming, I had no idea I would need to become an expert on soil science. But as the years have gone on, I've realized that my capacity to understand what's happening below my feet di-

rectly impacts the success of my farm business. **Healthier soils mean healthier food which creates healthier communities.** By focusing on soil health we can adapt our farm practices to reduce our carbon emissions and sequester carbon in the soil. At Bumbleroot Organic Farm, we have begun experimenting with no-till farming techniques that will reduce our fossil fuel use and increase biodiversity in the soil. With healthier soils we expect to see higher yields with less off-farm inputs (fertilizers, fuels, organic pesticides, *etc.*). In the long run, incorporating these techniques will make our farm business more resilient to the effects of climate change and more profitable through better crop yield.

Over the past few years we have worked with UMaine Extension on multiple **Sustainable Agriculture Research and Education Grant (SARE)** projects that specifically look at these techniques. In 2018, we hosted a cover crop trial that looked at the results of different combinations of cover crops on soil health and weed suppression. For the past 2 years we have participated in research to determine the impact of tarping over-wintered cover crops and the effects this practice has on weed suppression and crop yield.

The strength of our local food systems depends on the adaptability and resilience of farmers in the face of changing weather patterns and more extreme growing conditions—agriculture has to be part of the solution. Programs such as **SARE,** soil health initiatives, and incentives for organic and regenerative practices will help farmers build more sustainable farm businesses, build stronger more resilient soil, and grow healthier food for their communities. We thank this Committee for its support of SARE over the years. But currently, SARE is appropriated at $37 million. It is critical that farmers are given the right tools and know-how to meet the challenges of a changing climate and agricultural landscape. SARE is equipped to help them do so and increasing investment into this program is of key importance. As Fiscal Year 2020 discussions continue, I urge this Committee to work with your colleagues on agriculture appropriations to defend the House bill and its $45 million funding level for SARE.

Climate Change

We see climate change as the primary challenge our business will face in the decades to come. We are finishing up our fifth growing season and we're already feeling the impacts of extreme weather patterns. Last July we had a hail storm sweep through our farm, and it wiped out our entire onion crop and damaged many of our field crops. Just last week we had another storm with record winds in the Portland area—we were without power for days, relying on generators to keep our coolers running and fall crop storage secure.

We have directly benefited from **Natural Resource Conservation Service (NRCS)** programs such as **Environmental Quality Incentives Program (EQIP)** and **Agriculture Management Assistance (AMA)** that have allowed us to build five high tunnels, or greenhouses, which protect our high value crops and extend our growing season. These greenhouse structures have allowed our farm to grow vegetables year-round, even through the snowy Maine winters, which provides consistent income for our families as well as healthy, fresh food for our community 12 months out of the year. In the summer, the plastic provides shelter for our more vulnerable crops like tomatoes, peppers, and eggplant from potentially damaging weather, as well as protection from pest pressure. By integrating these high tunnels into our farming operation we have built a more resilient, more profitable business. As young farmers with limited financial resources, having access to funding for these high tunnels has allowed our business to grow more rapidly than we would have otherwise. I want to thank Members of the Committee for its work in supporting these vital programs in the 2018 Farm Bill which increases the payment cap for the EQIP Organic Initiative. But this increase in the payment cap is still far below the payment cap for General EQIP and I urge that the separate payment cap within EQIP be promoted in conjunction with a state-based allocation for organic and transitioning participants.

Another area that we see as critical to building a more resilient farm in the face of climate change is incorporating **renewable energy** on farms. Last winter we explored adding solar panels to our barn that would cover the electricity needs of the farm business as well as two homes on the property. After scrutinizing the costs and our business financials, we decided the project was cost prohibitive for our young business. Greater funding for renewable energy on farms through **Rural Energy for America Program (REAP)** would have a huge impact on transitioning farms from fossil fuel based systems towards electric ones. From heating greenhouses to running tractors, the potential for renewable energy on farms in vast. Encouraging and incentivizing farms to transition to renewable energy is a direct way we can cut carbon emissions on farms.

As I mentioned earlier, the importance of soil health on our ability to mitigate and adapt to climate change cannot be over-emphasized. By utilizing **regenerative farming practices** to build soil, we can sequester carbon from the atmosphere and significantly reduce the erosion and the harsh impacts of flooding and drought. By increasing funding for research into new techniques and technologies, farms of all sizes can adopt practices that allow the agricultural industry to combat climate change rather than contribute to it.

Young Farmers

As farmers finishing our fifth year in business, we've experienced some of the challenges that are far too common for all young farmers across the country. After struggling for our first few years to secure reliable land tenure, we were able to purchase our farm from Maine Farmland Trust through their "buy, protect, sell" program. MFT purchased the property from the Week's family that had farmed the land for generations at market value, placed an agricultural easement and OPAV (Option to Purchase at Agricultural Value) on the property, and then sold it to us for less than ½ the initial cost. The importance of **agricultural easements** to make farmland more affordable to young and beginning farmers can not be overstated. We are grateful for programs like **ACEP** (Agricultural Conservation Easement Program) that enable land trusts across the country, like MFT, to offer agricultural easements and make farmland more affordable for young farmers. Greater funding for ACEP would allow land trusts to offer more easements without having to continually apply for more funding. As pressure grows from development, suitable and affordable land near major markets has become inaccessible to farmers just starting out. This past year we've had farmer friends of ours close their business because they were unable to figure out their land tenure. Further funding for land protection is essential to ensure that the next generation of farmers have affordable land to establish their businesses and be our food producers for years to come.

As young, organic farmers in Maine, our business has benefitted from so many Federal programs. Program funding through the **BFRDP** (Beginning Farmer and Rancher Development Program) such as MOFGA's (Maine Organic Farm and Garden Association) **Farm Beginnings Course** has allowed our farm business grow with intention and given my partners and I the business knowledge to effectively run our small farm business. Other programs such as **Organic Certification Cost-Share (OCCSP)** helps alleviate the financial cost of organic certification, allowing us to invest that money back into our business. Increasing funding for these programs will insure that young farmers and organic growers have the resources they need to be lasting businesses and food producers in their communities. In total, $40.4 million is provided under the 2018 Farm Bill for OCCSP over the next 5 years, which unfortunately is a cut below OCCSP's previous funding level of $11.5 million per year. As more farmers transition to organic and the demand for cost-share assistance increases, it's possible that funding may fall short in the later years of the 2018 Farm Bill. It will be important, therefore, to closely monitor demand and total funds that remain available as implementation moves forward.

I want to thank the Committee for providing mandatory funding for the Value-Added Producer Grants (or VAPG) and the Farmers Market and Local Food Promotion programs, which were combined in the Local Agriculture Market Program (LAMP) in the 2018 Farm Bill. While VAPG is used by all farmers, organic farmers have successfully utilized this program to increase their market opportunities. VAPG has historically received both mandatory and discretionary funds due to the high demand for this program, and so I would encourage you to work with your colleagues on agriculture appropriations to ensure the House bill's $15 million funding level is included. I would also encourage this Committee to support the House Bill's additional $5 million for the Farmers['] Market and Local Food Promotion Programs, which would fund these programs at their historic levels. These programs have helped small and mid-sized organic farmers expand their operations to reach new local and regional food markets.

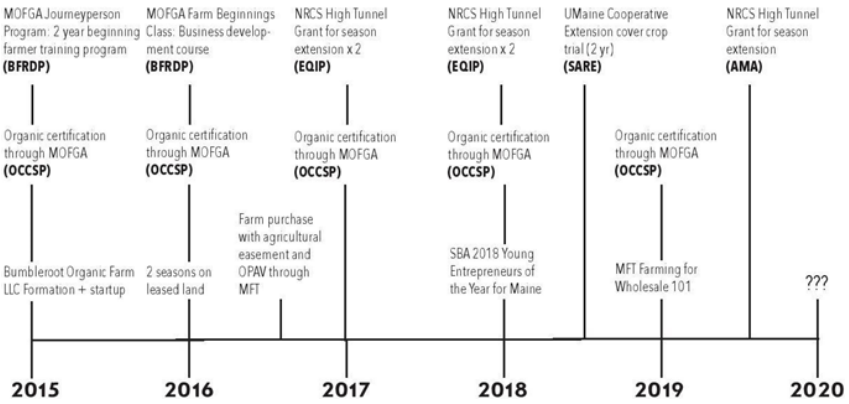
It is my view that the future of organic farming and organic food in our country involves more small family growers. We need to support these farms today. By supporting small scale organic growers we are directly investing in greater resiliency for our local food systems. By helping farms transition to organic and encouraging the adoption of regenerative practices, we can help organic farming be part of the solution to mitigating and adapting to the effects of climate change.

Once again, I would like to thank the Subcommittee for giving me the opportunity to testify today on the state of organic agriculture. I am happy to answer questions you may have.

ATTACHMENT

BUMBLEROOT
***organic* FARM**
WINDHAM, MAINE

OUR FIRST 5 YEARS:
HOW FEDERAL PROGRAMS HAVE HELPED GROW OUR FARM BUSINESS



Takeaways

(1) **Organic Certification Cost-Share Program (OCCSP):**

As a small business and young farm, every cost counts. Adhering to the National Organic Standards set forth by the National Organic Program has always been a priority for us, although it can be costly. Every year we've been in business, the OCCSP has reimbursed us for up to 75% of the application fees and inspection fees we incur in order to be certified organic.

(2) **Beginning Farmer and Rancher Development Program (BFRDP):**

Beginning farmer training programs have been crucial in building a solid foundation for our business. We started our farm with no business background and these programs have instilled fundamental business planning principles that are essential to our long-term and annual planning, as well as our day-to-day decision making.

(3) **Environmental Quality Incentives Program (EQIP):**

As vegetable producers in Maine, the NRCS high tunnel program has allowed us to extend our growing season into the long, cold winter months. We are now able to grow greens year-round in our high tunnels, harvesting spinach and lettuce in January and February when there is still snow on the ground. This allows us to provide fresh, organic produce to our community year-round, and provides our business with the income it needs to support us through the winter months.

(4) **Sustainable Agriculture Research and Education Grants (SARE):**

The future of food depends on the adaptability and resiliency of farmers in the face of changing weather patterns and more extreme growing conditions. SARE offers farmers the opportunity to participate in and benefit from research that leads to innovation, more sustainable practices, and higher productivity. Our farm is a trial site for our local Cooperative Extension's SARE study which is focused on expanding no-till practices through cover cropping and the use of tarps.

The CHAIR. Thank you for your testimony and the information. I now turn to Ms. Brin. Please begin when you are ready.

STATEMENT OF SHELLI D. BRIN, MARKET MANAGER/ AGRITOURISM MANAGER, RIDGE TO REEF FARM; FARM DEVELOPMENT MANAGER, HIDEWAY FARM; BOARD MEMBER, VIRGIN ISLANDS GOOD FOOD COALITION; MEMBER, VI FARMERS ALLIANCE, FREDERIKSTED, ST. CROIX, VI

Ms. BRIN. Thank you. Thank you, Chair Plaskett, Ranking Member Dunn, Members of this Biotechnology, Horticulture, and Research Subcommittee. I am here today to share my experiences, Shelli Brin, and that of Dr. Nate Olive's of Ridge to Reef Farm, our farmer perspectives on the organic industry, and the U.S. VI.

It is truly an honor to be here now before you in our nation's capital, adding our voices to the many who see a brighter future for our country through regenerative farms of organic agriculture.

In order to ensure a future of a healthy, local food system, now more than ever, we need your support. Ridge to Reef Farm is located in Frederiksted, St. Croix. We are the only USDA certified organic farm in the U.S. VI. Over the past decade, Dr. Olive and I have maintained a diverse planting system of over 100 varieties of organic fruits and vegetables across 150 acres. We raise animals and have created several forms of farmers' markets and farm events over the years. Our mission is to help reverse the food trend of food import dependency, which is greater than 98 percent in the VI. Which, despite our efforts, remain the same. We have experienced an increase in emerging threats that hamper our organic operation in many forms, and blocks to others interested in entering the organic market. Here are just a few insights into our farm's challenges. Please see my written testimony, as it goes into detail.

In the VI, we are very susceptible to the mislabeling of produce as organic, domestically produced, and imported. While on the mainland, U.S. organic producers can benefit from the organic label, we have experienced no price-added value benefits different from other non-organic producers. The Farm Bill of 2018 has given the National Organic Program, NOP, additional authority to protect the integrity of the organic label, and so, we need NOP to include our territory in its research and its reach.

With no enforcement of the USDA Organic Marketing Rules and without public and farms knowing set standards of organic practices, they have no way of knowing if they are consuming or growing organic. We do believe farmers of different methods all need to work together to enhance our food security, such as in our Farm to School hub. Yet, the integrity of the certified organic production that we are a part of needs protection for it to be worth maintaining and increasing on a wider scale.

Due to our geographic location, we are challenged in our ability to get certified and remain so. Our expenses are disproportionately higher compared to others, plus we have very high expenses getting access to OMRI materials, which greatly limit organic production for us and for others.

In just 10 years of working our soils, Dr. Olive and I have farmed through floods, droughts, suffered serious livestock losses, and are dealing with the territorial aftermath of two category 5 hurricanes. And now, we are experiencing intense heat waves and an increase

in pests and disease. And yet, we have had many successes that are worth noting.

I ask that you make sure that the USDA includes us and other insular territories in organic research programs and studies. From our perspective as organic producers, here are just three of our six recommendations we submitted.

One is to encourage more consumer and producer education about the NOP Program and organics in general in rural areas, especially including our islands. Number two, increase the cost-share amount proportionately to the higher costs required in insular areas; and three, relax restrictions on organic materials and supplies that need to be shipped in that are treated differently than if they were being sent to the continental U.S.

As the market demand for local and organic increases, we have a generation of young American farmers, such as Nate and myself and others, who value the NOP standards and are good stewards of our lands and of our waters. We want to do right by the land that we farm and the communities that we serve. We have entered farming in challenging times in an already high-risk market. I believe with more inclusive organic research, current barriers being removed from organic production and transitions, we can further take our rural communities from living life on the edge of food deserts to food-secure.

I would like to thank the Subcommittee for giving me the opportunity to testify today before you on our needs as organic growers like us, and others in small outlying American communities who are on the front-lines of environmental and market changes. Thank you to all the hardworking people in the Agriculture Committee and Subcommittees and USDA and the agencies, and to all those who choose to farm today.

Thank you.

[The prepared statement of Ms. Brin follows:]

PREPARED STATEMENT OF SHELLI D. BRIN, MARKET MANAGER/AGRITOURISM MANAGER, RIDGE TO REEF FARM; FARM DEVELOPMENT MANAGER, HIDEWAY FARM; BOARD MEMBER, VIRGIN ISLANDS GOOD FOOD COALITION; MEMBER, VI FARMERS ALLIANCE, FREDERIKSTED, ST. CROIX, VI

Thank you Chairwoman Delegate Plaskett, and Ranking Member, for the opportunity to testify before the **House Committee on Agriculture Subcommittee on Biotechnology, Horticulture, and Research.**

I am here today to share my experiences and that of Dr. Nate Olive's of Ridge to Reef Farm, **Farmer Perspectives of the Organic Industry in the U.S. Virgin Islands,** to bring awareness to the need for further support for organic agriculture in the USVI.

It is truly an honor to now be before you here in the nation's capitol adding our voices to the many who see a brighter future for our country through regenerative forms of organic agriculture. More than ever we need understanding and support in order to ensure a future Virgin Islands organic farming community and a healthy local food system.

My name is Shelli Brin, a multi generational Virgin Islander. I am a member of the newly forming VI Farmers Alliance, on the board of the Virgin Islands Good Food Coalition, and am a farmer and an advocate for organic food, local food security, and the Farm to School program. For the past 10 years I have worked alongside Dr. Olive, farm owner of Ridge to Reef Farm in St Croix, and since February I am currently working on an agroforestry project in St Thomas, at Hideaway Farm.

Compared to many demographic areas in the U.S., the USVI has an incredible strong community of farmers and residents traditionally participating in farming on many levels. This is a farming community worth investing in and worth USDA's programs. Today I'll share with you just our story.

Ridge to Reef Farm, located in Frederiksted on the island of St. Croix, is the only USDA certified organic farm and is among the most productive farms in the United States Virgin Islands. Over the past decade, farm owner Nate Olive and I have maintained a diverse planting regime of over 100 varieties of organic fruits and vegetables across 150 acres primarily for local consumption in the territory. We also husband pasture-raised sheep and hogs that are not certified organic due to the lack of available cost-effective organic certified feed and supplies. Our mission is to help reverse the trend of food import dependency, which is greater than 98% imports, for our insular territory while demonstrating ecologically regenerative and culturally appropriate agricultural practices in the region.

Primary markets for our products include market stands, supermarkets, a Community Supported Agriculture membership program, and the territory's Farm to School program for which we serve as a multi-farm aggregation hub. In addition, agritourism activities such as tours, farm to table dinners, and the hosting of volunteer groups for farm stays are a significant value-added part of our mission-based educational outreach and financial sustainability.

First, as a small farm in a small market in a large sea, we are thankful to have Federal support in the form of programs and grants that help us implement conservation practices and create new economic development opportunities through value-added products. In the past 2 years, we have received a $7,500 reimbursement as a match for an off-grid solar irrigation system batteries though the USDA Rural Energy program, approximately $18,000 (50% of actual cost) for a high-tunnel for tomato, pepper, and cucumber production from the Environmental Quality and Incentives Program, and approximately $22,600 in a 50% match to conduct a feasibility plan for fruit market expansion with a Value-Added Producer Grant (VAPG). We eagerly await the release of the 2019 VAPG grant in order to implement our plan for long-term agroforestry food production. These programs are crucial to improving our farm's impact in our community, however we mostly survive from our own hard work and supportive customer base and do so with farming as our sole occupation.

We also are participating in storm recovery programs through the Farm Service Agency, which are still ongoing from the impacts of hurricanes Irma and Maria. However, our small local office is extremely understaffed and is aligned under the Puerto Rico office, which leads to constant and significant delays for information or decisions regarding these programs. Additionally, most of these programs are reimbursement based, leaving us and most other farmers unable to fully participate since our businesses and income were slammed to halt from the natural disasters. Also, the USDA is not forthcoming in helping us understand what costs can be covered and what rates. They seem more concerned with preventing program abuse than farm recovery, leaving us in the dark about program details and therefore exposing us to risk of acquiring debt that we may not have reimbursed, as we have already seen documented with local farms since the storms.

Second, being the lone organic farm in an isolated territory has limited benefits and significant challenges. A local market survey we conducted revealed that more than half of our customers don't require certified organic as long as they know it's "grown organically". However, without a standard set of organic practices to be followed, they have no way of knowing as most farms are not fully aware of the National Organic Program standards and practices and many farms buy in crops from other farms with no transparency. In the USVI there is zero enforcement of USDA organic marketing rules, which drastically diminishes the organic label. Customers are often deceived by the use of the word organic in farm names and crop descriptions. Consequently, the value of being certified is greatly diminished. We embrace other forms of food production and believe farmers of different methods all need to work together to enhance food security, such as in our farm to school hub. Yet the integrity of certified organic production needs to be protected for it to be worth implementing on a wide scale for sake of human and environmental health.

Third, costs of establishing and maintaining organic certification is drastically higher on island territories and needs greater support in cost-share programs than what currently is offered. We simply would not be certified today without the Federal cost-share program which saves us $750 a year on program related costs, which total approximately $2,000 annually. The primary reason is geographic, since inspectors must travel by air and receive accommodations, meals, ground transportation, and other related costs. For example, we had to change certification companies 8 years ago because the former company quoted over $4,000 for a single inspection in travel costs. We are fortunate now to have an inspector available from nearby Puerto Rico, however, we remain vulnerable to any changes that may occur and subsequently threaten our ability to afford certification.

Fourth, a lack of access to OMRI-approved materials such as fertilizers, pesticides, seeds, propagation materials, and many other things needed so successful organic production is a perennial problem that limits our production and drives up costs exponentially. Very few companies will directly ship organic supplies here, and some items are very hard or impossible to get. Because of shipping restrictions placed on the territory treating it like a different country, we routinely go through a purchase procedure only to be told at the end of the process they do not ship here. Options then are to ship to Florida to then be shipped on a boat, which is subject to delays in customs and excise taxes, even though we are supposed to be exempt from excise taxes as a farm. For example, we often lose half a valuable day proving that our empty cardboard produce boxes are for our farm. This is true for all farms, not just organic. However, because we are the only organic farm few stores carry OMRI approved items, so we have to ship in more. Additionally, we can't get items with roots or soil like grafted premier tomato plants, since they would die in freight shipping and aren't allowed to be shipped directly to us.

Overall, we maintain our certification because we want our customers to be confident that they are receiving the highest quality of food available and avoiding genetically modified foods. However, as it stands today, we likely do not benefit greater than the costs to be certified organic. Also, we want our customers to know for certain that their food was grown in a way that helps repair the natural systems of the land and sea instead of unnecessarily impairing them. When you live on a small island you are faced with limits too often taken for granted on the continent. Our waterways, coral reefs, and fisheries are intricately intertwined with the way we produce food on land. So, if we are serious about turning the tide of import dependency to local food production, it is crucial to proceed with organic practices that won't ruin our natural food systems. We must avoid creating aquatic dead zones that result from over-nutrification of the waters such as seen in the tragic example south of the outflow of the Mississippi River. Our food security and sovereignty depends on it.

In just a short 10 years in working our soil and starting our farm, we have farmed through floods, droughts, suffered serious livestock losses from neighbor's dogs, and dealing with the territorial aftermath of two category 5 hurricanes. Organic farming is already difficult in the tropical region in that we have no freeze that gives our crops a break. Now that our climate changes are getting more intense, we are now experiencing serious heat waves, and increase in pests and diseases. With ocean acidification and polluted run off after heavy rains, we are rapidly losing our food sources from the sea as well. We are truly on the front lines of how organic will hold up to a rapidly changing environment.

Finally, from our perspective as organic producers, our recommendations for the future of the NOP are:

(1) Encourage more consumer and producer education about the NOP and organics in general in rural areas, specifically in isolated island territories.

(2) Increase the cost-share amount proportionally to the higher costs required in insular areas.

(3) Relax restrictions on organic materials and supplies needed for organic production in territories that are treated differently than continental locations in shipping.

(4) Encourage state and territorial agricultural authorities to support better compliance with organic marketing rules to protect organic integrity in the marketplace.

(5) Build the capacity and decision-making ability of local USDA offices to better represent organics and other programs available to farmers and get to the point where officers can regularly visit farms and help with paperwork.

(6) Reduce the amount of paperwork required for organic certification, particularly for small farms.

Having farmed these past years with Dr. Olive and now expanding my farming to St. Thomas, has been a rewarding experience for us. Farming is difficult yet we reach milestones every month for the territory.

This is a challenging environment to farm. In addition to searching for certified organic seeds for the tropical region, my tree selections are now based solely on salt tolerance, drought tolerance, and ability to handle wind, and genetic preservation. My tree selections and prunings are now focused on dwarf varieties. I'm also focusing on native fruit trees that can survive better in our environment. I am currently looking through what USDA programs will help me adapt my farming techniques to more climate resilient strategies. We are working hard to figure out ways to build water capacity for the coming dryer years.

In the USVI, we share many of the USDA's mission of increasing food production, sustainable natural resource stewardship, ending hunger, improving our country's health, and its commitment to helping improve the economy and quality of life in all of rural America. I believe the USDA is the most poised government agency to affect the greatest possible change in the quality of life in our country. We ask that you include the USVI and other insular territories in more of your economic research studies going forward. It will help our community and the nation. Dr Olive often says the islands are a microcosm scale of national issues. He's right. If included in more national studies, I believe it can hold many of the solutions to other small American rural community living life on the edge between food security or food desert.

In the USVI, we share many of the USDA's mission of increasing food production, sustainable natural resource stewardship, ending hunger, improving our country's health, and its commitment to helping improve the economy and quality of life in all of rural America. I believe the USDA is the most poised government agency to affect the greatest possible change in the quality of life in our country. We ask that you include the USVI and other insular territories in more of your economic research studies going forward. It will help our community and the nation. Nate often says the islands are a microcosm scale of national issues. He's right. If included in more national studies, I believe it can hold many of the solutions to other small American rural community living life on the edge of food security or food desert.

I would like to thank the Subcommittee for giving me the opportunity to testify before you today on the research needs of organic growers like us in small outlying American communities who are on the front-lines of environmental and market changes. And thank you to all of the hardworking people within the Agriculture Committee, subcommittees, USDA and all of its agencies. I am happy to answer any questions you may have.

SHELLI BRIN.

The CHAIR. Thank you very much.

Mr. Brown, please proceed with your testimony.

STATEMENT OF JEREMY BROWN, CO-FOUNDER, BROADVIEW AGRICULTURE, INC.; MEMBER, EXECUTIVE COMMITTEE, PLAINS COTTON GROWERS, INC.; MEMBER, BOARD OF DIRECTORS, TEXAS ORGANIC MARKETING COOPERATIVE, LAMESA, TX

Mr. BROWN. Yes. Good morning. Thank you, Chair Plaskett, Ranking Member Dunn, and Members of the Committee. I want to thank you for this opportunity.

I am a farmer, and I love what I do. I get to go out every day and steward God's creation, and I take a lot of pride in that. I don't like to distinguish myself between an organic farmer *versus* a conventional farmer, because each one of us goes out there and takes on a lot of risk to grow a safe food and fiber source for the American people.

As Chairman Conaway said, I farm in Dawson County. If you don't know where Dawson County is, it is a desert. The sand likes to blow and it is flat. It is where you can see your dog run away for 3 days. But it grows really good cotton out there, Mr. Conaway. I am really proud of the fact that out there I am a fourth-generation cotton farmer. I grew up farming with my dad, my granddad, and my great grandfather.

But, as Ranking Member Dunn said, the risks that are involved in production agriculture—as everyone knows, my father had to get out of farming when I was a student at Texas Tech University. But I got smart. I married a woman that her dad farmed, and he let me get back to the farm. And so, that is where I am today. I currently also serve on the Executive Committee of Plains Cotton Growers, which is our certified producer organization there on the

High Plains, and I am also a board member of the Texas Organic Cotton Marketing Cooperative.

I currently farm about 4,000 acres there, and what happened was is when my father-in-law let me take on some land, he had some land that was in the Conservation Reserve Program, which is the CRP. At that time, that land was coming out of contract. This was in 2010, and he encouraged me to look into organics as an opportunity because you could go right into the program. And so in 2010, we took that land and put it into production agriculture, and specifically, cotton. We now grow out of my 4,000 acres that I farm, I now have about 1,000 of it is certified organic. We have been adding land as we can throughout the years.

As I mentioned, organic production can certainly provide producers with market opportunities, since production is limited. On average, organic cotton production in the U.S. only makes up about 0.1 percent of the U.S. crop; however, it has steadily been increasing in production. Because of the limited amount of organic cotton production, coupled with demand and niche markets, price and opportunities for organic production typically are better than conventional.

As I said, in 2010 when I grew my first organic cotton crop, we were able to sell our lint at that time for $1 to $1.30 per pound. As my colleague down the road here that has an organic dairy, we also sell the byproduct of cotton, the cottonseed, to some of the local organic dairies where we get a premium for that seed also.

For reference purposes to the Committee, cotton, as you know, is marketed very uniquely compared to other row crop commodities. The differentials, also referred to as the loan rate premiums and discounts are calculated based on market variations, and based on what the quality of the cotton is. Organic is just the same. The USDA classes our cotton, and that goes into a pool that we market to our buyers, and as our climate, we cannot control our weather patterns. Sometimes our quality is better than others. But our buyers come and they receive bales from the pool containing cotton of the quality and specifications they have requested, and are charged the price related to that pool.

As I said, we started doing this by transitioning land that was in the Conservation Reserve Program, but there is only so much of that. I began to add more land through transition. As you know, it takes 36 months from the time of the last time a chemical was applied to that land to get it certified organic. However, not all my land is situated for that. When I decide to transition a portion of my farmland to organic production, there are other things that I have to consider.

As I said, I farm in west Texas, and we have a tough climate. It is a tough place. Sometimes I wonder why we are growing cotton, but it grows well out there, and it does really well for organic cotton. As you might know, most of the organic cotton is grown right there on the Texas High Plains because we have very low insect pressure. We have a kill and freeze that defoliates the cotton naturally before we can harvest it mechanically. And so therefore, it is a great place to grow organic cotton, and I am glad that I have it as part of my business.

As I said, thank you for allowing me the opportunity. I love farming. I consider it my passion, my desire. I feel like we do it safely for the American consumer and beyond, and at this time, I would like to answer any questions that you might have.

[The prepared statement of Mr. Brown follows:]

PREPARED STATEMENT OF JEREMY BROWN, CO-FOUNDER, BROADVIEW AGRICULTURE, INC.; MEMBER, EXECUTIVE COMMITTEE, PLAINS COTTON GROWERS, INC.; MEMBER, BOARD OF DIRECTORS, TEXAS ORGANIC MARKETING COOPERATIVE, LAMESA, TX

Chair Plaskett, Ranking Member Dunn, and Members of the Committee, thank you for the opportunity to appear before you today.

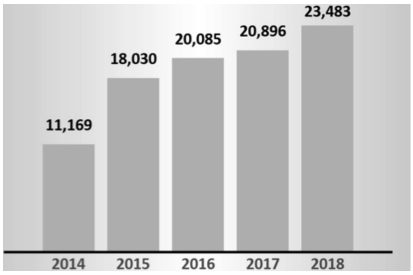
For the record, my name is Jeremy Brown and I am an organic and conventional cotton farmer in Dawson County, Texas. I also currently serve on the Executive Committee of Plains Cotton Growers, Inc. (PCG) which is our certified producer organization composed of cotton producers from the Texas High Plains and I am a board member of the Texas Organic Cotton Marketing Cooperative (TOCMC).

Thank you for holding today's hearing to review the state of organic agriculture from a producer's perspective. Currently, I farm close to 4,000 acres of cotton, wheat, rye, corn, grain sorghum and cover crops. 1,100 of the 4,000 acres is in organic based production. I began farming in 2008. At that time, all of my land was under conventional based practice's. In 2010, I began to convert some acreage to organic cotton production. Largely this was driven due to more favorable market conditions and the timing of an expiring Conservation Reserve Program contract.

Pricing Opportunity

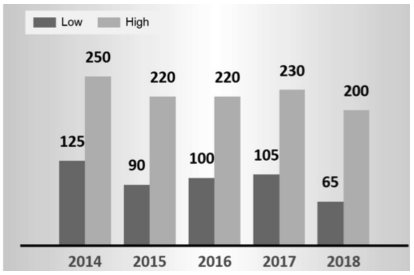
As I mentioned, organic production can certainly provide producers with market opportunities since production is limited. On average, organic cotton production in the U.S. makes up 0.11% of the U.S. crop and has steadily been increasing in production. Because of the limited amount of organic cotton production, coupled with demand in niche markets, pricing opportunities for organic production typically are better than conventional. In 2010 when I had my first organic cotton crop, lint pricing opportunity for organically grown cotton compared to conventionally grown cotton that year was almost double ranging from $1.00 to $1.30 per pound of lint. In addition to lint, organic cottonseed typically brings more value to a producer. In 2018, organic cottonseed prices ranged from $400 to $525 per ton as compared to $155 to $225 per ton for conventional cottonseed.

Organic Upland and American Pima Bale Production



Source: USDA, AMS Cotton and Tobacco Program.

Organic Upland and American Pima Lint Prices in Cents per Pound



Source: USDA, AMS Cotton and Tobacco Program.

For reference purposes to the Committee, cotton is marketed very uniquely compared to other row crop commodities. The differentials, also referred to as loan rate premiums and discounts, are calculated based on market valuations of various cotton quality factors for the prior 3 years. Since I sell my cotton through a cooperative, my cotton is marketed through a cotton pool made up of cotton from other producers. USDA classing specifications are used to classify each bale of cotton into different quality pools. Payments to producers are then determined by the pool in which the bale is assigned, giving producers an incentive to grow the highest quality

cotton possible. However, quality, like yield, is somewhat subject to weather conditions that are beyond the farmers' control, resulting in some year-to-year variations in the percentage of the crop in each pool. The quality pools are the basis of my cooperatives price structure. Buyers receive bales from the pool containing cotton of the quality specifications they have requested and are charged the price related to that pool.

Additional Considerations for Organic Production

Land that I initially transitioned to organic production was relatively easy since that land did not have any conventional crop protection products applied to it, however, converting conventional farmland into an organic state takes dedication and time since the land must not have any conventional crop fertilizers or pesticides applied to the land for 3 consecutive years.

When deciding to transition a portion of my farmland to organic production there were also other factors outside of pricing opportunities that I had to consider. The region where I live in Texas is a well-suited environment for organic cotton production. Winter temperatures are cold enough to limit insect pressure and provide a hard freeze to defoliate the cotton plants naturally prior to mechanical harvest. Additionally, we have fully eradicated the pink bollworm and boll weevil in our region. Our climatic conditions and quick-drying soils also help aide with some weed control.

Challenges That Exist with Organic Cotton Production

While pricing opportunities as referenced are prevalent in organic cotton production, we are not without our challenges. In many years, since I farm in an area with limited or no irrigation, my organic cotton yields are very rainfall dependent and can vary significantly from year to year just as a conventional crop can when grown in the same type of environment. However, in ideal conditions, organic cotton yields are often times less than conventional yields. For these reasons, it is critical that producers continue to have access to affordable, effective crop insurance products for organic crops. In addition, safety net programs in the farm bill provide important support for both conventional and organic production on an equivalent basis.

Additionally, depending on where we gin our cotton, we tend to pay higher ginning costs than conventional producers because the gin has to perform a cleanout when it transitions from ginning conventional cotton to ginning organic cotton in order to meet the organic program standards.

We spend a great amount of effort and time on soil health and building our soil profile naturally. In order to do this, I can plant a green crop and plow the plant residue into the soil profile before planting cotton. Additionally, I spread compost as a natural fertilizer. While we do have some crop protection products that can be used on an organic crop, often times it is very expensive and, in my experience, does not work well. The natural way I choose to build nutrients into my soil profile does take longer to build into the soil, when compared to conventional production, where nutrients can be incorporated into the soil mechanically at various intervals.

Probably one of the largest challenges I have as an organic producer is sourcing enough labor. As I mentioned previously, our climatic conditions do provide very minor aid in weed control, however, we spend a lot of time mechanically and manually controlling weeds which takes more labor to do across 1,100 acres. As such, more cultivation is required of an organic crop as compared to conventional crop production which can impact the level of sustainability and climate-friendly practices.

In closing, I want to thank you again for the opportunity to be here today. Certainly, as you can tell from my testimony that there is value in organic production to a producer and our ultimate end-user—the consumer, just as there are benefits to growing conventional production for consumption. In either farming practice, we as producers are great stewards of our land. We focus on soil health and nutrient management through innovation and technology and by adopting good farming practices. We do these things not only to create value in our product, but also to produce the safest most abundant supply of food and fiber to feed and clothe our own families, friends, neighbors and the world.

If Members of the Committee have any questions, I will be happy to address them.

Thank you.

The CHAIR. Thank you to our witnesses. That was very informative and really helpful to the Committee in hearing from you all as to what you are going through in the farming area.

Members will be recognized for questioning in the order of seniority for Members who were here at the start of the hearing. After that, Members will be recognized in the order of arrival.

I will recognize myself for 5 minutes.

My first questions are for you, Ms. Brin. Can you explain more about challenges you face related to your organic certification due to your geographic distance from the mainland, if any?

Ms. BRIN. Sure. Well, actually tomorrow our organic inspector arrives, so we are currently going through this year's process. Because we don't have someone that is in the Virgin Islands, we have to cover their expenses, their airfare, lodging, transport them to and from the farm, as well as go through just the regular certification process. We have changed certifiers. In the beginning, we even got quoted one time $2,000, or it might have even been $4,000, to bring someone to do the process. Luckily, Nate is very good at working out logistics and he was able to find us a company who has an inspector in Puerto Rico now, so now we are able to get someone from there. But yes, just the transportation of bringing them over here.

The USDA Cost-Share Program is $750, which is okay, but we definitely would need something—we would need USDA to look at improving that program.

The CHAIR. If the person were driving, the $750 would be helpful, but if the person has to fly and then stay overnight before he can get another flight back—how often does the certifier or inspector have to come?

Ms. BRIN. Once a year.

The CHAIR. Okay. The other thing I wanted to ask you about was as the only certified organic farmer in the Virgin Islands, do you believe that USDA was responsive to your needs? If not, how could they be more responsive?

Ms. BRIN. They could be more responsive in a couple ways. We did submit some recommendations that will definitely help make it easier for us as well as for others to do the process, but the USDA does have some challenges with reaching us. For one example, as I mentioned earlier in the testimony, is that we just don't have any presence of the USDA recognizing, promoting, or even just supporting the existing organic production that we do. We have had so many cases of even our local staff just not having the information, not having accurate information, not having timely information, and so, there could definitely be some improvement there. Just having a presence, a better presence for organic farming.

The CHAIR. Thank you.

I wanted to turn to you, Mr. Pierson. I know that you have been waiting for the proposed origin of organic livestock rule, a final ruling on that. How important is that to the organic dairy sector?

Mr. PIERSON. Yes, thank you for that question. It is critical to the organic dairy sector. It is going to be difficult for me to overstate this. I have the opportunity to travel around the country for regional meetings for the co-op, and I get the opportunity to meet with thousands—I am sorry, hundreds of dairy farmers every year. And every one of them, 100 percent, really question me why in the world can't this be done in an expedient manner?

To me, and all the other farmers that I encounter, under—this indefensible loophole that is a gross misinterpretation of the spirit and the intent of the organic rule is hard for us to even accept. I mean, several of my colleagues now have talked about how important it is that the organic rule is adhered to, both for the confidence of the consumer and the safety of our industry.

The CHAIR. Not having the final rule creates uncertainty in your livestock? How does that affect your——

Mr. PIERSON. Yes, it definitely creates uncertainty in our operation and in the industry as a whole. It has allowed very few farmers in the United States—dairy farmers in the United States to have a very significant cost advantage over the rest of us. And that is what is really causing a lot of the problem.

The CHAIR. Thank you.

Ms. Brin, one other question. We have heard from other researchers about the need for resilience and the research that they are doing to support farmers, and to become more resilient in a changing climate.

What are the specific challenges that you face? I know that you talked about drought and hurricanes as well as now intense heat. How are you overcoming that?

Ms. BRIN. We are still trying to figure it out, honestly. One of the ways that we are trying to grow more resiliently, just in our own production, is we have had the help of a hoop house greenhouse tunnel that has really helped us with being able to grow crops that are more on demand in the market. That has helped, but one of the ways that the USDA and this Agriculture Committee can help support us in being more resilient is the way that we are responded to during these disasters. It is really common that after a natural disaster, we are given only the option of a loan or a reimbursement program. That is very difficult when a farmer is going through a crisis. I can't tell you how many times we were offered loans after a hurricane. And it is something that I really just want to encourage the USDA to revamp on how they are going to respond to farmers, because we are already dealing with debts. We are already dealing with loss of crops, livestock, assets, just money to get gas to go to the store to buy a few supplies. And so, that is one area that we really need to revisit on how we are responding to farmers.

The CHAIR. Thank you.

I now turn to Mrs. Hartzler, for her 5 minutes.

Mrs. HARTZLER. Thank you, Madam Chair, and thank you all for being here, and for your wonderful testimony.

Mr. Brown, first I want to congratulate you on your service as one of the faces of farming and ranching, and I can tell just from your testimony already that—and your passion and love of agriculture that you are a wonderful person to be a face for agriculture.

I was just wondering, for those who don't know, only one in five agriculture producers are selected to represent the industry by the U.S. Farmers and Ranchers Alliance, you have traveled the country doing various public appearances, national media interviews, web chats, social media activities, all to educate consumers about farming and ranching. And so, I just wondered if you could briefly tell

us about your experience and what one thing surprised you as you visited with consumers?

Mr. BROWN. Thank you. First off, it was a great experience. I consider it a huge honor to represent farmers and ranchers. To me, they are the salt of this Earth. We go out there and we take on a lot of risk every day, as it was mentioned, with really no guarantees. We can't control the weather and we can't control the markets. And it is kind of crazy if you think about it.

But, one of the biggest eye openers was how much disconnect there is now from the consumer to the farm, and also how much misinformation that is out there about production practices.

Also one of the things I was also proud of was that so many times nowadays with social media and the different things, avenues that people have access to, a lot of people question the information that they are hearing. They don't know if it is truth or not. And when I would be in front of people talking to them and actually tell them that I am a real farmer, it is like people still have a general respect for us that steward the land, and I was proud of that. I found that most of the time there is a disconnect, but normally you go two generations back or three generations, and oh, my great grandfather farmed or my great grandfather has this, and there is still a love for the land. And so, we found that in common. It was just a great experience.

Mrs. HARTZLER. Thank you. I am a lifelong farmer myself, so I appreciate you getting out there.

And as you farm in west Texas, you likely face pest pressure from bollworm in cotton and sugarcane aphid in grain sorghum, among others. On your conventional acres there is biotechnology available that allows you to protect your crop while spraying less insecticide. That same technology is not allowed in your organic production, so what do you do to protect your organic cotton acres from pests?

Mr. BROWN. Yes. Well, where we farm there in west Texas, because of our colder climate, our pest pressure can be quite low. You mentioned the sugarcane aphid. That is one crop right now that I currently will not grow organically, because we cannot control that pest. It will devour it within 24 hours, which limits us on crop rotations, as was mentioned.

We try to do things naturally the most that we can. We try to have a habitat where we promote beneficial insects, whether that is plant pollinator habitats in certain areas. We just do the best job we can. We scout our fields during the year, weekly, to this date since 2010, I have not had an issue where it was going to be devastating to my crop. I mean, you will have flare-ups from time to time, but most of the time, we can manage those and go on down the road.

But it is something that we are always looking at and making sure that we just do what we can to attract as many beneficial insects as possible.

Mrs. HARTZLER. Great, thank you. I have a couple other quick questions.

Mr. Huckaby, you talk about your carrot rotation, and I am sure I have eaten a lot of your carrots. I really enjoyed your testimony and hearing about all the acres and the crops that you grow.

What do you plant on the other years? You say you plant your carrots every 3 years and crop rotation, so I am just curious.

Mr. HUCKABY. Yes. Thank you for that.

Yes, carrots are our biggest crop and you do grow carrots once every third year in the same soil. When we started growing organics, we did not have necessarily a rotation crop. We were working with grains and a few other commodities to try to figure out that rotation. And it wasn't until 2001 when we bought Cal-Organic Farms who came with 30 different items, about six different lettuces, broccoli, cauliflower, several brassicas, onions and a few other things did we realize the benefit of rotation between—from crop to crop benefitted the carrots and all the other subsequent crops.

Today, we actually have 65 different items that we do everywhere, from potatoes and onions to the lettuce crops. We do a lot of greens, radishes, beets, and like I said, it is a full program now. We know that we can't stand alone with carrots, I actually say what we do in the off years from the carrots is more important that what we do during the year of the carrots. We have learned through organic farming that crop rotation, building your soil, having the healthiest soils out there is significantly more important than what we felt originally, and that is what is produced, the highest quality. And like I said, we actually get higher yields on a lot of our organic crops than we do conventionally.

Mrs. HARTZLER. That is amazing. Thank you very much. I yield back.

The CHAIR. Thank you.

Mr. Van Drew, of New Jersey, you have the next 5 minutes.

Mr. VAN DREW. Thank you, Madam Chair.

I know none of you probably think of New Jersey as an agricultural hub, but here are a number of metrics, the Garden State ranks near the top of agricultural production with over $1 billion in sales, and about ½ of that alone comes from my Congressional district in south Jersey, according to the last Census of Agriculture. My district in south Jersey ranks as top producer in almost every category with respect to agriculture in the state, including organic farming with over 50 different operations.

Organics is a growing industry. Just last year, New Jersey saw a 47 percent increase in organic farm gate sales.

With that being said, and with the obvious growing interest to know what is the food and products we produce and eat, I believe it is necessary to provide the appropriate levels of funding and resources to ensure the needs of organic producers are being met for the future.

Mr. Huckaby, I am wondering what opportunities there may be for New Jersey producers in the organic market? We have a very strong production of vegetables, fruits, greenhouses, and nurseries, just to name a few. From your experience, what do you see as the best opportunities in the future in the organic market, going forward?

Mr. HUCKABY. All right, thank you.

When you look at our production in California, we are able to produce 365 days out of the year, but that is not necessarily what all the retailers want. They do want a year-round program, but a

lot of the retailers like to capitalize on local markets and they are interested in food miles, trucking products from California to the East Coast. And so, what we have found and what has worked out really well for us is that we back off our production during the summer months when other areas of the country can come in to production, so that we are not flooding markets. We are making opportunities for other people, and we work with the retailers. There are several East Coast retailers that we don't start production until November 1 for them, and then we go through the winter months and into April. And then we back off and we just supply the local markets and the West Coast, although we still have contracts across the nation. But we found with our production in Georgia and Florida that there are a lot of opportunities for local regional product, and especially on the organic side. We have a lot of consumers interested in where their products are coming from, and so, I do think there are quite a few opportunities in the Northeast, the Southeast, and other regions.

Mr. VAN DREW. And just an aside—I should know the geography of California better. All of the natural disasters that are occurring right now—this has been a really tough time for California. Is any of it affecting the growing markets?

Mr. HUCKABY. Yes, that is a good question. Where we are at in the Central Valley, besides just a lot of smoky air, we are not having any issues with getting production out. California is constantly in a drought situation, it appears, and so, availability of water is probably the biggest issue that we deal with, having the surplus water to continue to farm in all the different areas.

But, we deal with earthquakes and big fires and droughts and extreme temperatures all the time; but, we don't get the rains that we are finding out that they do in Georgia and Florida, significantly different than where we farm in California. But right now, I don't know that it is impacting too many of the markets, other than disrupting some of the production due to power being shut off and not being able to produce and cool and run the products.

Mr. VAN DREW. Okay. Mr. Whalen, in your testimony you discussed some of the challenges and programs you have dealt with as a young farmer. Could you also explain from your experiences what opportunities there are for young farmers trying to break into the organic industry?

Mr. WHALEN. Yes, thank you. I think there are tremendous opportunities for young farmers in all markets. I think the potential for more localized food systems is tremendous, a lot of the farms that we have seen, friends of ours that have gone out of business, it has really been a land access issue. It hasn't been an access to market issue. And securing land tenure for young farmers, especially where we are in southern Maine where land prices are increasing, where closest to the market for us, which is Portland, just the availability is decreasing every single year. And with development, the growth and populations around urban areas where the markets primarily are, this access to land there is decreasing.

Trying to find ways to protect that land through conservation easements, agricultural easements, and transition it to making it accessible to young farmers.

Mr. VAN DREW. Do you have a lot of people interested in—I live in a tourism area. A great deal of my land mass is devoted to tourism, and we have the oceans around us.

There are a lot of farm-to-table restaurants that are really popping up. Do you have that same experience?

Mr. WHALEN. Yes, absolutely. Maine is being recognized nationally, Portland specifically, for the food community and the restaurant industry, and the tourist industry in Maine is large. We get an influx every season of tourists to the state, and that has driven a really robust culinary community in Portland, and we directly work with 20 restaurants in town. We are working with chefs every week. I am personally delivering vegetables to them twice a week, and interacting with them on what is fresh, what is available, what is coming. And for us, we are—right now we are trying to figure out how we can supply those restaurants in our community longer into the winter months.

Mr. VAN DREW. Thank you. Thank you, Madam Chair.

The CHAIR. Thank you. That is very interesting, the relationship between the organics and the restaurants and that is a real area that we should be looking at and supporting.

Mr. Baird, you are up for 5 minutes. Thank you so much.

Mr. BAIRD. Thank you, Madam Chair.

My first question goes to Mr. Brown. In your testimony—and I appreciate your enthusiasm for agriculture. I share your passion for that industry, and so I just thank you for that, as well as all the others. You are involved in an industry that I think a great deal of.

But in your testimony, you mentioned that your organic acres as well as your conventional acres, you focused on soil health, nutrient management, and overall good farming practices. Could you give us some examples of the good farming practices that you feel that overlap between your organic and your conventional farming, because I certainly agree with you that soil health, we fail to recognize sometimes that soil, in essence, is a living, breathing organism. It takes in oxygen, takes in nutrients, provides that to the plant. I would just be curious to what you have found that overlaps between organic and conventional?

Mr. BROWN. Yes, thank you. Some of the practices are different. Everybody farms in different areas, and that is one thing I want to make sure we understand is that what works in one area sometimes does not work in another. It doesn't mean we can't try it and get some common ground there, but in my organic production, we have to till the soil. That is our only form of weed management. For whatever reason, the weeds come no matter what. And where I farm, it is a desert, dry climate. The weeds come and our only two forms of weed management in cotton, when you are going across 1,000 acres, is tillage or manual removal of the weeds. And that is a labor issue that we have to deal with.

From a soil health perspective, in my conventional land I don't till the land. We use a lot of cover cropping, a lot of rotation, a lot of diversity in trying to build the soil health. I am passionate about that. That is one of the things I spend most of my time on is how can I improve the soil health, both in my organic and my non-or-

ganic land. Both of them produce challenges when you are in a dry, arid climate.

Take this year, for instance. This has been a rough year for cotton country. It quit raining June the 5th or so in our area and didn't rain until September. In the soil health, one of their five pillars is having a living root system at all times, and that makes it quite a challenge when it is not raining. We are working on that.

I was excited to—there was a pioneer in regenerative agriculture named Gabe Brown. He was on my farm on Sunday, and Gabe and I spent all day just trying to figure out how we can improve what we are doing, because I am passionate about it.

We are using cover crops. We are using diversity. We are using rotation when we can; however, where I farm, at the end of the day, cotton is the only thing that really grows good where I farm. I wish I could grow other crops, but they just don't net us the income that we need to be sustainable from a business perspective. But we are continuing to grow and learn new things, and we have a lot to learn. Yet, the soil is the life of our business, and so, we have to take care of it.

Mr. BAIRD. Thank you.

I have one other question for Mr. Huckaby. It is hard for me to perceive 45,000 acres or 40,000 acres of carrots. How many machines does it take to harvest 40,000? How many tons to the acre do you get?

Mr. HUCKABY. Well, carrots are pretty unique. They are mechanically harvested, so I will give you an analysis: 40,000 acres of carrots is 10 million pounds of carrots run every day, 6 days a week, 52 weeks out of the year. It is a lot of orange going through our facilities. But one harvester can harvest about 25 tons every 20 minutes, and that requires two people and that is it. The average tonnage is about 37½ tons per acre. It is a very mechanized crop.

Mr. BAIRD. Thank you very much. I always try to learn something every day, so I appreciate that.

The CHAIR. Mr. Baird, I appreciate that, and we were just talking that we think we need a field hearing to see that. I can't even believe it.

Ms. Schrier, of Washington State, you have 5 minutes.

Ms. SCHRIER. Thank you. First, thank you to all of you for coming and talking about how committed you are to your land and your work and I just want to say first that I appreciate it.

Second, I thought that question from Mr. Baird was hilarious, and Mr. Huckaby, I thought I would just tell you—and I am sure this made a huge difference in your profits—that my son and his friends had a competition at school one day at lunch as to who could eat the most carrots. And my son won with 38.

Mr. HUCKABY. Oh, wow.

Ms. SCHRIER. Baby carrots, just to clarify.

I had a couple questions. Mr. Whalen and Mr. Huckaby, you both talked so much about crop rotation, and even the interspersed years are more important in many ways than the carrot years. And so, I wanted to ask a couple questions about that.

Are there standards out there for crop rotation, whether there is adequate crop rotation, any enforcement? Does that play in at all?

Mr. HUCKABY. Under organic standards, you are supposed to be cover cropping in the off years to try to build your soils. There is no specific that you have to follow on a crop rotation. We have some crops we grow once every 7 years. Carrots happen to be one every 3, and then it is just what we have done through trial and error that we find which crops we can follow, and which ones don't work well to follow. And each one seems to benefit the other as we put this program together, and that is what has made us successful is trying to figure out this blend that one crop will benefit the next. And it is what is more important than even some of the fertility programs that we use is how are you building your soil for not this year, but next year and the following year is so important to us.

And I agree, we should have more carrot eating carrot contests, see how many carrots we can eat.

Ms. SCHRIER. I will tell him.

And Mr. Whalen, I was thinking that other challenges with crop rotation, because we all recognize how important that is for soil health, what are the markets like for the crops that you are rotating? I mean, potatoes are probably easy, but turnips are probably a little tougher. And so, I was wondering what your comments are about that, and how maybe the USDA could help?

Mr. WHALEN. Yes, there is never enough consumer education that can happen around vegetables. Where we are in Maine, our seasons are short. We rely, especially this time of year, pretty heavily on storage crops like turnips, and there are only so many turnips people are willing to eat this time of year, and especially in the winter.

But a huge part of what we try to do, because we are able to work directly with our consumers and our customers, is to educate them on what they are eating, and the benefits that it brings to the farm. The beauty of a diversified farm is that when somebody comes to pick up—we have our CSA pick up this afternoon on our farm—they are getting a box full of really tasty spinach or lettuce greens, you are getting kale, but with that, you are getting turnips or potatoes or kohlrabi, things that folks usually aren't used to cooking at home. We try to educate all of our consumers on ways to do that, including the chefs that we work with in town, try to say this is what we have, this is what we are growing and we like to grow it. It is really easy to grow for us. It is great for the soil. Is there a way that you can incorporate this into what you are doing?

Again, it comes back to consumer education, and I don't think there could be enough of that.

Ms. SCHRIER. Sure, that is great. Maybe even recipes inside that CSA box.

I had another question about some threats. This was just—I happened to be in New Orleans this weekend, and on the menu—and this was a little strange for me, because I have lived in California and Washington and Oregon, so you would never see this—was hydroponic lettuce. And I just thought what is the story with hydroponic lettuce, and is this the new thing? What does this do to our organic farmers, because now a hydroponic lab, essentially, is growing without any of the risks that you are incurring. And I just—

I had never seen this before. Can you talk about this and whether it is a threat to you?

Mr. WHALEN. I think the debate about hydroponics right now and organics is—people are very vocal on either side about it. Where we stand for our farm, we are soil based, and find that hydroponics are literally—there is no soil involved. It is all in water, and there are a lot of inputs that go into that system. Where our approach to agriculture comes from regenerative principles where we are trying to build soil health because of the vast environmental benefits that come with that, and the healthy food that can come out of that, and a huge part of that is trying to reduce our inputs on farm as much as possible, which is just very different from how hydroponics operate.

Ms. SCHRIER. Thank you for farming the way you do, and doing what you do.

The CHAIR. Thank you.

I wanted to know, Ms. Brin, if you wanted to say anything? I know that there are hydroponic farmers on St. Croix, and does that affect your organics competition, or how does that work for you?

Ms. BRIN. Yes. Actually right now, we work with a hydroponic farm to help supply our Farm to School Program. We definitely support them and we hope that they do well, but part of the trend of hydroponics and aquaponics is responding to less access to land. That is part of how the market is—or how growers are responding, because we don't have the soil to work in anymore. We are now growing in buildings and trying to grow wherever we can. It is just life trying to grow again.

There is a debate that is happening right now, whether hydroponic can be considered organic; however, we are really just based in the soil. We really need our soils to do well. Yes.

The CHAIR. Thank you, and I just want to also let everyone know, part of her Ridge to Reef's education of consumers about new products is they have a once a month almost dinner where you can come and eat the products there. I invite you all to come to the Virgin Islands to St. Croix and come to a slow-cooked dinner where you can see the hundreds of different crops that they have at Ridge to Reef.

My good, good friend and buddy, Mr. Ted Yoho of Florida, you have 5 minutes. No more.

Mr. YOHO. No more. Thank you, Madam Chair, and I will go to the Virgin Islands with you to watch that stuff.

The CHAIR. You are coming anyway, so you don't need that invitation.

Mr. YOHO. That is great. Thank you.

I appreciate you all being here. Mr. Pierson, I understand you are a Gator, too?

Mr. PIERSON. I am. I hope to do well this Saturday against——

Mr. YOHO. We are going to do well. Anybody else out there a Gator?

Mr. PIERSON. Well, they should be.

Mr. YOHO. Oh, man. Not everybody can get into Florida. We are proud of our school and we are proud of what it has done.

I appreciate you all being here because you represent a sector of ag that has a remarkable amount of growth. And it amazes me

when I go to my grocery store, the organic section used to be real small. Now they are pushing out other stuff, and we want to make sure we maintain the integrity, not just of the organics in different areas making sure people aren't bringing in counterfeit products, calling it organic. We want to maintain that, but agriculture all together. And hydroponics is amazing. It is a wave of the future. I remember going to Disney World when they first opened in Florida and they had the hydroponic farms, and we have talked to several people that marry that to other forms of agriculture. And what we have seen is with the fish farms, the nutrients out of the fish farms are so rich that they can grow hydroponics that are more lucrative than the salmon. And so, that is something that we are going to see. And as you pointed out very succinctly, it is very little land being used. And you are recycling a waste product that normally would go into the environment.

In this whole realm of things, one of the questions—we have to protect ag all together because we are in ag, and I have been associated with agriculture for 15 years. I am a large—or since I was the age of 15, actually, since I was a baby because I have been eating food. I am a large animal veterinarian, so I have been around that—the realm since I was about 15 years of age. And ag is something we have to protect in total. Organic, traditional, hydroponics, all these things, and the ones coming out in the future.

One of the things that came up was a—last year an advertisement appeared in the *Wall Street Journal*—I am sure you are aware of it—displaying a list of *chemicals* that would not appear in organic foods. One of these so-called *chemicals,* by the way, was "genetically modified organisms," and had quotes around it, like it was this blob out of a science fiction movie. And that is something we fought here, because we spent a lot of money in our ag research universities, Florida, to do research on this, on the GMOs, but yet, there is this negative connotation out there on the internet. And I know it is easy, it is kind of like a political campaign. You can always pick up something negative and use it against your opponent. But we don't want to do it at the detriment of traditional farming. Because we have the Nobel laureates, the hundreds—over 100 of them have come out and said there are retrospective researches that have found no problems with GMOs.

We need to work collectively together to keep agriculture strong, especially in this environment when the ag population in America is about one percent of the population, and is shrinking because of the age. And so, I hope we keep that in mind so that we don't go against that.

One of the things I have for the Committee as a whole—or the panel as a whole is when I talk to organic producers and non-organic or traditional, I hear from the traditional side that I have a guy that sells organic strawberries. He has 10 acres, but he is selling about 50 acres worth of strawberries. What safeguards do we have to make sure people are going to play by the rules? And I know where there are people and there is money to be made, sometimes things get bent as far as integrity.

Anybody want to comment on that?

Mr. PIERSON. Well, I would just like to say that we take organic integrity extremely—as a very high priority, if we can talk about

organic integrity for a minute. That is why we feel that the NOP should have a rigorous and effective method to *police,* if you want to use that word to make sure that farmers are doing what they say they should be doing.

Mr. YOHO. I think that is a good word.

Mr. PIERSON. The fact of the matter is, my personal opinion is human beings, being human beings, there are going to be people, bad actors, both in conventional and organic that want to exploit the rules, live in the gray areas. And that is why when we talk about OOL (Origin of Organic Livestock rule), we want to make sure that these areas are well-defined and well-policed. And that is why we support also the organic——

Mr. YOHO. I am going to have to cut you off because the Chair said I have 5 minutes. I don't want to make her mad.

Mr. PIERSON. Okay. I am sorry.

Mr. YOHO. But I do appreciate that, and will follow up with you on some questions.

Thank you, Madam Chair.

The CHAIR. Thank you. Just to touch on what you were just discussing, Mr. Pierson. I know that for your organic cows, you rely on organic grain to feed those. The threat of fraudulent organic grain imports—do you think that the language from the 2018 Farm Bill is going to be beneficial or helpful to you all in ensuring that that doesn't happen?

Mr. PIERSON. I believe it is taking a very strong step forward in helping with that, and yes, that was a big problem. We went through what we called the Gold Rush in organic dairy around 2015, and there was a shortage of organic grain produced in the United States and Canada at that time, and it opened up markets for foreign markets to come in. We were very concerned about the organic integrity of those foreign markets.

We expressed those concerns to the NOP, and the NOP has responded in taking effective steps to help control that.

The CHAIR. Thank you.

Mr. Yoho, you wanted to add something?

Mr. YOHO. I am glad you brought that up, because that was one of my questions. I didn't realize I rambled so long.

I sit on Foreign Affairs too, and we deal a lot with China. And we know the ASF outbreak out there. China is shipping organic soybean over here. They are drying them on the roads, if they are in an agricultural sector in China, those pigs, I am sure, are around that area or a truck goes through there that goes on that farm. We cannot afford to have ASF here, and we need to make sure that these feedstocks that are coming into this country are not tainted with that. And that is something we should have a future hearing on, because it is vital to our national security.

Thank you for the extra time.

The CHAIR. Thank you, and thank you, Ms. Pingree, for your patience. Your 5 minutes—and I know that you have done so much work, and I rely on you quite a bit in the discussion and being a thought leader in the organic space, so I am looking forward to hearing your questioning.

Ms. PINGREE. Well thank you, Madam Chair, and thank you to everybody on this Committee for all the good questions. But par-

ticularly, thank you to all of you for both the work that you do and the really great conversation we have been having today.

I have been interested in this area for a very long time. I have been an organic farmer and run a certified organic farm since some time in the 1970s, so I go way back to the era when this was all kind of hippie Birkenstock and nobody thought it was a serious business. Now is it a $50 billion business, and it has been really wonderful to see the number of conventional farmers who have gotten new market opportunities, just all the great things that are going on, and so much of it is driven by all the things you have been talking about in conventional, in consumers' interest in the marketplace.

I am also very well aware how hard it is to stay as a certified organic farmer. Those are really rigorous standards, and the issues you are bringing up about organic fraud, those concerns, cost of inputs, challenges with land ownership. You have really covered a lot.

The other thing I just want to quickly say is the role that all organic farmers play today in enhancing environmental practices, which we have so much concern about, carbon sequestration, which you do as a matter of practice, resilience, increasing your yield. I mean, there are so many good things going on that I think there is a new interest in learning more about as we look at the changing climate.

Just a couple things that I haven't heard come up that I want to talk about.

This whole issue of scale, there was a long time ago Secretary of Agriculture said, "Get big or get out," and small farmers were told there was no place for them. Then recently that came up, again, is there any market for small dairy farmers? And what you really represent is an amazing range of scale. The other thing we hear about a lot is people say like organic is nice, but we could never grow enough under these practices.

Each of you can address this in a different way. Certainly, Mr. Huckaby, you have talked about being the largest carrot producer. You can't be any bigger than that. And to talk about carrots at scale, you are already there. Then, Ben, you are on the opposite side, but talking about supporting four people off a relatively small farm that goes directly to consumer and has a market in that way. And then, of course, dairy farms are a constant question. I am just going to let you guys discuss it in your own way, because it is such a difference but it represents what can be done out there.

Mr. HUCKABY. Well, thank you for that. I would just comment to that that we have taken organics, obviously, to scale that most people haven't been able to do, and a lot of it has to do with where we farm in California. It makes it a little easier than some of the other areas to farm. And we got in at a time—I have been doing it a little over 20 years. We got in at a time when organics was really taking off, and a lot of the mainstream consumers were starting to entertain buying organic. And so, we got on at the right time and were able to kind of ride the wave.

But, as I travel around and we farm now in seven different states, and we deal with most of the major retailers, it seems that there are opportunities from the smallest producer to large, main-

stream producers. But the one thing we have learned along the way is that you can't cut any corners. We still farm every acre like we did when we had ¼ acre, and I still have plantings that are ¼ acre to ½ acre of dandelion greens and different things that we produce.

But, you cannot cut any corners in organics if you are going to have high quality, predictable yields. And that is what has helped propel the organic movement even more is figuring out how to grow these things year-round with equally as good a quality or better than we have conventionally.

Ever since we have kind of figured that out through the crop rotation and building our soils to where they need to be, the market has just taken off. But I still see that there are opportunities for local. There are opportunities from the farmers' market all the way up to the largest warehouse stores.

Ms. PINGREE. You want to talk about being small?

Mr. PIERSON. As far as scale in our industry, our co-op, our mission is to support small family farms, and *small* is a relative term and it is defined by each individual. But we have 1,800 dairy farmers: 95 percent of our milk is produced by herds with less than 100 cows, and the average size herd in our co-op is 72 cows. We still have hand milking Amish in our co-op.

I was on the phone with a gentleman the other day from Iowa, he milks 20 cows by hand. He called me to tell me about some of the issues he is having. But that being said, I strongly feel and the co-op strongly feels that there is room for all different sized operations in the organic dairy industry, and the organic industry, as long as we are all playing by the same set of rules. And we all have to have a level playing field on that.

And so, we are supportive on how a person wants to farm, as long as they are performing with the NOP.

Ms. PINGREE. That is great.

I have run out of time, so I am sorry, Ben, because I know you have a lot to say. But you have already talked a little bit about the importance of direct marketing and CSA's and dealing with families, which seem to be really important for the small farmer, and thank you for explaining that to us.

And thank you, Madam Chair. I am out of time.

The CHAIR. Thank you.

At this time, Mr. Rodney Davis.

Mr. DAVIS. Thank you, perfect timing.

The CHAIR. You do it all the time.

Mr. DAVIS. That is perfect. The pitfalls of multiple committee hearings at the same time.

The CHAIR. But you have a system. You are a pro. Thank you for being here.

Mr. DAVIS. Well, thank you, and I have to tell you, I make this comment often. She is doing a heck of a lot better job than the last Chair.

The CHAIR. That was him.

Mr. DAVIS. Chair Plaskett, a good friend of mine.

And I do apologize to the witnesses that I wasn't here to see your testimony, but I do want to ask a question of Mr. Huckaby. You mentioned in your testimony the USDA Organic Program is the

most highly regulated food system in the world. The organic industry is unique in that farmers and businesses want the program to have strict regulations and standards for the sector. Can you talk about why it is so important for your business to have strong and consistently enforced standards?

Mr. HUCKABY. Sure, thank you.

As a farmer, most farmers want less regulations typically when they are out on the farm and farming, but with organics, for us to have a highly regulated sector that everyone has to follow the same standards, rules, and regulations, it is important to the consumer. The consumer wants to know exactly what they are getting. They want to know what practices were put in place, and they don't want it to differ from one state or one area *versus* the other. To me, it is consumer driven. They want the confidence in what we produce, and what we are allowed to produce, the time allowed between taking fields from conventional, converting them during the transition period to organics. There needs to be these standards that everyone follows the same rules so that we know that the end product is very similar throughout the nation. And I think that is extremely important from a marketing standpoint that we differentiate ourselves from conventional, and we are a huge conventional farm, too. We do both, but there are different practices that we do under each one.

And I think making the differentiations between the two is very important so that the consumer has a choice, but they know what they are getting when they decide to pay more for organic, that they know exactly what they are getting.

Mr. DAVIS. You are right. It is the consumer. They want that label to mean something and they are willing, as you said, to pay a higher price for those products.

Mr. HUCKABY. Absolutely.

Mr. DAVIS. And in turn, you have a higher cost of production, which gets you then a higher return to go with those higher costs, which provides that cost-benefit analysis to stay in that organic industry.

What is the biggest threat to that label right now, and the consistency within that label?

Mr. HUCKABY. I actually think for us the biggest threat is some of the foreign products that are being brought in that maybe haven't had quite the scrutiny and the standards in the foreign countries that are being imported in that don't, or have a tendency not to play by the rules as much as here. We are very highly regulated. We are very highly monitored. The paperwork, the visits that we get regularly, especially the scale and size that we are. And I would go back to fraudulent and some cheating maybe that happened.

I have been doing this for a little over 20 years, and in the U.S., there is less and less of that. I don't look at that as a big problem in the U.S. of people not following the rules. The enforcements are there, and every year we get better and less issues with maybe nobody, not everyone being as truthful as they have been in the past.

Mr. DAVIS. Well, I mean, I want to work with you, and I know those of us on this Subcommittee want to work with you in a bipartisan way to ensure that label remains consistent.

Mr. HUCKABY. Thank you.

Mr. DAVIS. We tried to do the same with a GMO label just recently a few years ago, because at some point customers—they need to know what the label means. And if you have no standards, you don't know what that means. You could have a label on a package, but if you don't know what is behind that label, how do you know if it is just a marketing ploy, or if it actually has some standards behind it.

I am glad you mentioned the foreign import issue, but we have a demand and a supply problem here when it comes to organic, Mr. Huckaby. We are going to continue to see the demand for organic groceries and organic food grow. How do we meet that demand? Can we do it without importing? What can we do as policy makers to help expand opportunities for those who want to be conventional and organic farmers like yourself?

Mr. HUCKABY. Yes. One of the issues that is kind of a preventative measure for switching from conventional to the organic is the transition period of 3 years, which to me, is a great period of time for you to rebuild your soil. And I am a conventional farmer, but we know that our soils on conventional are not nearly as rich. Fumigants and things are hard on your soils. But to take that 3 years and transition everything and get the soils built up is a necessary step in order to get good organic production, but it takes a lot of money and be willing to sit out 3 years. If there are some subsidy programs or things through USDA to try to stimulate more people to move over to organic. We have proven that you can get the same yield on organic that you can on conventional over and over again, but it takes time to build your soils and it takes that window of opportunity that is lost. And somehow, we are going to have to make up for that period and entice farmers to want to move to organic.

Mr. DAVIS. Thank you, Mr. Huckaby, and thank you, Madam Chair. I yield back.

The CHAIR. Thank you.

Mr. Panetta, your 5 minutes.

Mr. PANETTA. Thank you, Madam Chair. I appreciate this opportunity, and appreciate you holding this hearing on such a very, very important topic, especially when it comes to where I represent, the Central Coast of California.

Once again, ladies and gentleman, my name is Jimmy Panetta, and I want to also thank you for your participation in this hearing, and your preparation to be here and the fact that you are here, so thank you very much. I apologize that I missed your testimony, but I did read some of your testimony. And some of the things that you have to say, I want to ask about.

But, there is one issue that is sort of prevalent, and an issue that you, as well as many people in agriculture agree, that affects all of our production capabilities.

Like I said, I come from the Central Coast. It is otherwise known—and many people or my peers know that I always say this, and I will continue to say this—as the salad bowl of the world. Correct, Rodney?

Mr. DAVIS. That is correct.

Mr. PANETTA. Thank you. As I said, they know that, and now you do too. And I say that because we have a lot of crops, hundreds of specialty crops. That is what we—obviously, that is our number one thing and our number one industry there. Conventional, yes, and definitely organic. In fact, we have had leaders in the organic history emanate out of the Central Coast, Santa Cruz, Mark Lipson in particular, who have just been stalwart champions of the organic vegetable industry.

But, as we have gone forward for Mark and other leaders in that area, what we have seen is that yes, there are a number of issues that you face in organics with grants and crop insurance and research. But the number one issue, I believe, is labor, and we are hearing that not just on the Central Coast, but in the center of America all the way to the East Coast. My good friend Rodney Davis and my good friend Ted Yoho would agree to that as well. And we obviously have heard that, and we have been working to fix that as well.

In fact, this afternoon Chairwoman Lofgren and Dan Newhouse from Washington and myself, as well as Mr. Carbajal sitting next to me, and a number of other Democrats and Republicans, and yes, TJ Cox—thank you, TJ, I didn't see you over there—are going to be introducing the Farm Workforce Modernization Act, a bill that not only protects our existing workforce, but makes it easier to have an enduring workforce here in this country.

But, I also know that it is going to take a lot more effort as we go forward, and it is going to take not only your contributions, but your information as to what you are saying about labor and how that is affecting your production.

And so, I know Mr. Brown and Mr. Huckaby, you spoke about the challenge of sourcing enough labor for your organic operations in your written testimony, and I would love to hear what you have to say on the importance of creating this type of stable workforce for your organic production, how important that is and what the challenges you are facing as well.

Mr. HUCKABY. Yes, you are right, so thank you for that question.

You nailed it. Immigration labor, a solid labor pool is everything for us. We are fortunate that we in California where we are at have year-round work available, so we don't have the influx of needing several hundred people 1 day and then not because our crops are always producing. That stable workforce has helped us retain a lot of our employees. But that workforce is aging out, and we are having a tougher time replacing those workers. We are now farming in seven different states. It is an issue in all seven states that we face, the labor issue. And so in California, we do have a pretty decent supply of labor. Like I said, they are starting to age out, but we need to protect those workers that are there that have worked with us for so many years. And then we need to be able to get replacement workers for those as they age out, and be able to continue to replenish the workforce that is there that is willing to do the hands-on labor that is so much required in organics, the hand weeding, the cultivating of all these crops, the hand harvest of all of it. It is extremely important, as well as in the southern states where we are farming with H–2A labor. It is important that

we have a better process, a less cumbersome process to get those employees.

You were correct. The labor is probably the number one issue we deal with in all seven states that we farm.

Mr. PANETTA. Mr. Brown?

Mr. BROWN. Yes, I would agree. In organic cotton production, I would think—well, I know the reason why that—there are not more growers going to organic cotton production is because we don't have the labor to manually remove the weeds. I am fortunate enough that we have a good team that comes in every year that I have been dealing—working with for the last 10 years, but it is one of those limiting factors is nobody wants to do it anymore, and it is a challenge.

Mr. PANETTA. Understood, and I can tell you based on the bipartisan work that went into the Farm Workforce Modernization Act, it alleviates this and it addresses your problems.

So thank you. I yield back, Madam Chair.

The CHAIR. Thank you. Mr. TJ Cox, your 5 minutes. I just want to thank you also for the testimony of one of your constituents who is here with us, and look forward to your questioning.

Mr. COX. Thank you very much, Madam Chair. I am very pleased and take a point of pride that Mr. Huckaby and his operations are located in the 21st Congressional District, which is essentially the top agricultural district in the top agricultural state, and every time we pick up a carrot, we certainly think of you.

I really did want to say thanks so much for your question, Mr. Panetta. That was one of the things we did want to discuss is about how in both conventional and organic farming that labor is such an issue. We always hear about that, and this bill that will be introduced this afternoon directly goes towards that, those issues, and should be quite a bit of relief. I am very excited to be able to introduce that.

But, with regard to organic farming, I would love to hear more, Mr. Whalen, about some of the programs that were available through USDA and through the state really helped you, in other words, initiate your operations and continue to develop those?

Mr. WHALEN. Yes, thank you. Since the beginning of starting our farm, we have benefitted from Federal programs, from the Organic Certification Cost-Share Program, which we use every year, $750 of the $1,000 that we pay for certification. But one of the major programs that we have benefitted from and continue to is the NRCS EQIP and AMA programs, which we built—in the process of building our fifth high tunnel for. And where we are in Maine, extending our growing seasons into the winter and starting earlier in the spring has allowed us to access markets and really generate income year-round for our business and our families.

Similarly, the SARE Research Programs, we have partnered with UMaine extension on two programs, one that looked at cover crop combinations and the effects on weed suppression and soil fertility, and we are currently just wrapping up another research program for tarping as a way to suppress cover crop and suppress weeds and increase soil fertility as well.

A huge part of being a young farmer as well, the BFRDP programming, we have worked specifically through MOFGA, our state

certifier for business training, a winter business class that exposed us to ideas of running a business that as farmers we had no idea about how QuickBooks operates, and how to run successfully and market our product. And also, this past winter we worked with Maine Farmland Trust that offered a Farming for Wholesale Program, that gets funding through the BFRDP as well, that is really asking us to look at our business and figure out how we can scale it to a wholesale level for our local markets.

Mr. COX. I am going to assume that this type of funding is critical for you to be able to at least start what you are doing and to maintain operations?

Mr. WHALEN. It absolutely is. I think high tunnels are kind of the easiest example of something that as a small farm with limited funds, I don't know that we would have constructed those, and the benefit that we have gotten from adding those to our farm are tremendous. It can't be overstated.

Mr. COX. Thank you very much.

Mr. Brown or Mr. Pierson, if you could add any color that you could provide?

Mr. BROWN. On the USDA?

Mr. COX. Yes.

Mr. BROWN. Yes, we work with our NRCS local office, because as mentioned in my testimony, in our area we had a lot of Conservation Reserve Program land that was taken out and put back into production. We work with them on trying to make sure that we still have conservation practices. We have utilized some of the EQIP funding, that has helped.

But, the biggest challenge in production agriculture, no matter whether it is organic or non-organic, is our rising input costs are just outrageous. From equipment to whatever, and then you bring in the labor issue that we have to deal with in organic. And so, anything that we can utilize through USDA is a benefit.

Mr. COX. Great. Thanks so much, and certainly as Mr. Davis pointed out, we all know that the demand for organic products is just growing not only here in the states, but throughout the globe. Mr. Huckaby, can organic farming actually be scaled up to meet the world's growing demand?

Mr. HUCKABY. Yes, thank you. Yes, I do believe it can and we have proved that over the last 20 years. We have proven it by taking 45,000 acres out of conventional production and transitioning it out, and with the steps of cover cropping and diversity and composting, we now produce equally the same tonnage that we do conventionally we do on organic. It takes a while to get there. It is not—there are no shortcuts. You can't cut corners, and it is not an overnight fix, but with a long-term strategic plan, we feel like we can produce as many organic crops as we can conventionally.

Mr. COX. Well thank you so much. I do have more questions, but it looks like I am out of time, so I will yield back.

The CHAIR. Thank you.

Mr. Carbajal, your 5 minutes.

Mr. CARBAJAL. Thank you, Madam Chair, and thank you for having this very important hearing, and welcome to all the witnesses today.

I want to first start out by associating myself with Representative Panetta's comments. He characterized what is transpiring in a bipartisan way in a very, very eloquent way, and I happen to be a son of a farmworker, so when I hear farmworkers are aging out, we now have a delta, we have a broken immigration system, we have a delta of need for more farmworkers. Oftentimes when I meet with farmers, I say you are absolutely right. We need to find ways to fix our system.

Some children of farmworkers actually go on to get an education, live that American dream. Some even become Members of Congress, so I absolutely understand the need to continue to explore how we can create a more sustainable labor pool.

Let me just say that my Central Coast district is one of two Central Coast districts. Obviously, Representative Panetta represents the other. I represent the Central Coast, Santa Barbara, San Luis Obispo, and a little bit of Ventura. And I got to tell you how excited I am to have Mr. Huckaby here, since he is a major investor in my district, and certainly appreciate his celebration of his 50 years of being in business as a company, Grimmway. I also appreciate that Mr. Huckaby has really distinguished himself by creating a blueprint for successful organic production, and really appreciate that he has chosen to invest in the 24th Congressional District in the most lovely Central Coast district. There are over 300 district-wide organic operations in the 24th Congressional District.

Mr. Huckaby, you mentioned a very important point in your testimony that the future of organics will depend on the Federal Government keeping pace with the marketplace. Can you elaborate on that? What do you mean by that, and share with us some examples that perhaps go to the heart of that issue?

Mr. HUCKABY. Well, thank you. Once again, we appreciate all the support and everything that is going into this work labor force and immigration and everything that we can do to protect our workers and bring more workers. I know a lot of people are involved in that, and we look forward to better things to come.

But, when we talk about the USDA—so our biggest concern on organic is that we have very strong, strict rules and regulations that differentiate organics from conventional, and what we don't want to do is have multiple, multiple sectors, whether it is conventional and transitional and organic. I think of regenerative as part of organic, so we need to make sure that we don't confuse the consumer. And the consumer, they want to know what organic means and they want to have this stamp of approval from the USDA that says what this company has gone through and they are abiding by all the rules so this product is free of certain chemicals. It is grown in accordance to certain standards. They get the trust in the industry as well as the actual producer.

It is important that we have a very, very strict regulated industry. There are a lot of things out there with GMOs that the consumers are very concerned with, so they throw up red flags when people start talking about changing and modifying different organisms, but there is some technology out there that USDA and the NOSB needs to continue to look at when it comes to selective breeding and things. I can't speak about it because I am not in tune with that, but the government needs to make sure that they

are really looking hard at new advances in all technology as we move forward. There is a lot of technology changing in production farming right now, and I just think we need to make sure that we have the support with the government to really take and watch what is happening out there.

Mr. CARBAJAL. Thank you very much.

Mr. Whalen, I have very few seconds left, so the move of NIFA has been of great concern for many of my producers in my district that have expressed concerns, and especially as it relates to supporting research programs with information input on organic priorities. Can you share with me your thoughts on that?

Mr. WHALEN. Basically, anything that is limiting access to funds for research, especially on our farm right now, we are really trying to think about what are the practices that we can integrate at our scale that are going to help combat climate change, things like different selective breeds for seeds that are going to be more resilient on the farm. Anything that is holding that funding up is a detriment to the organic industry, and figuring out ways to kind of overcome those more administrative hurdles would definitely help.

Mr. CARBAJAL. Thank you very much.

Madam Chair, I yield back.

The CHAIR. Thank you.

I want to thank everyone for testifying this morning, and providing us with some incredible insight in the work that you are all doing in the organics field.

I think that we have seen from the testimony from our witnesses that regardless of the scale, the crop, location, geography, that there are some huge opportunities that are available in the organic space. I believe that the 2018 Farm Bill really went a long way in supporting this market, but we still have a lot of work to do, specifically from some of the conversations that you have given us and the information you have given us. Whether it is supporting new entrants, foreign organics coming into the markets, and how we can continue to support this industry and make sure that it is available to additional individuals. Thank you all for being here.

I want to remind everyone that although we have asked you questions and you have given those 5 minutes, I am really appreciative of the longer testimony, the written testimony that you have provided for this Committee and for the record. And then I just want everyone to know that under the Rules of the Committee, the record of today's hearing will remain open for 10 calendar days to receive any additional material and supplemental written responses from the witnesses to any questions posed by a Member. This hearing of the Subcommittee on Biotechnology, Horticulture, and Research is adjourned.

[Whereupon, at 12:11 p.m., the Subcommittee was adjourned.]

[Material submitted for inclusion in the record follows:]

ARTICLES SUBMITTED BY HON. NEAL P. DUNN, A REPRESENTATIVE IN CONGRESS FROM FLORIDA

ARTICLE 1

Genetic Literacy Project

SCIENCE NOT IDEOLOGY

GENETIC LITERACY PROJECT

https://geneticliteracyproject.org/2019/08/06/viewpoint-dissecting-the-fear-based-case-against-gene-edited-crops-in-organic-farming/

***Viewpoint:* Dissecting the fear-based case against gene-edited crops in organic farming**

STEVEN CERIER (*https://geneticliteracyproject.org/writer/steven-cerier/*) | August 6, 2019



Image: Shutterstock

For nearly 25 years, an alliance of high-profile environmental groups and organic food proponents have waged an effective scare campaign against transgenic (GMO) crops. Foods derived from these crops, the public was told, *could cause* † [1] food allergies, sterility, liver problems and even cancer. *A 2016 report by the U.S. National Academy of Sciences* [2] conclusively debunked such speculation, finding there is "no substantiated evidence of a difference in risks to human health between current commercially available [GMO] crops and conventionally bred crops." Today, more than *280 scientific institutions* [3] around the world maintain that GMO crops don't present a unique health risk to humans.

† **Editor's note:** due to the numerous instances of hyperlinked text in the following article the hyperlinks are reformatted, herein, as footnotes.

[1] *https://geneticliteracyproject.org/2019/06/19/podcast-glyphosate-tainted-breakfast-plant-geneticist-kevin-folta-debunks-fear-based-cbs-roundup-report/*.

[2] *https://www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=23395*.

[3] *http://www.siquierotransgenicos.cl/2015/06/13/more-than-240-organizations-and-scientific-institutions-support-the-safety-of-gm-crops/*

[Editor's note: This article is part one of a four-part series on the organic food industry's reaction to the introduction of gene-edited crops. Read part *two,*[4] part *three*[5] and part *four.*[6]] ‡

With the advent of gene-editing techniques—CRISPR-Cas9 being the best known—the social and political controversy surrounding agricultural biotechnology has shifted in recent years. These new breeding techniques (NBTs) allow scientists to develop crops that are *more nutritious*[7] or possess useful traits like *disease-,*[8] *drought-*[9] and *blemish-resistance,*[10] without inserting DNA from other species.



[David Dees, *https://ddees.com/wp-content/uploads/2017/09/Inside-Volume-2-Gallery-Image-11.jpg*]

Since the anti-GMO movement's chief complaint about transgenic crops was that they contained "foreign DNA," you might think activists would be ecstatic about this development. But that's not the case. Anti-GMO campaigners have attacked new breeding techniques as fervently as they did genetically modified crops, alleging these next-generation plant breeding tools are just "*GMO 2.0*[11]" and pose a threat to human health and the environment. Opponents of NBTs have been particularly successful in the European Union (EU), which has *effectively banned*[12] the cultivation of gene-edited crops—though some regulators and most scientists are *lobbying*[13] to change the regulations.

By trying to lump genetic modification and gene editing into the same amorphous category, anti-GMO activists have exposed the inconsistent nature of their ideolog-

---

[4] *https://geneticliteracyproject.org/2019/08/20/viewpoint-organic-food-movement-shoots-itself-in-the-foot-by-rejecting-crispr-gene-editing/*.

[5] *https://geneticliteracyproject.org/2019/09/24/viewpoint-how-organic-industry-opposition-to-crispr-gene-editing-encourages-pesticide-use/*.

[6] *https://geneticliteracyproject.org/2019/10/22/viewpoint-arriva%E2%80%A6anic-agriculture/*

‡ **Editor's note:** the hyperlink for *part 4* of the series, as posted on the Genetic Literacy Project's website is incorrect. The correct hyperlink is *https://geneticliteracyproject.org/2019/10/22/viewpoint-arrival-of-gmo-gene-edited-biofortified-crops-weakens-case-for-organic-agriculture/*.

[7] *https://geneticliteracyproject.org/2017/12/04/crispr-agriculture-technology-improving-crop-yields-nutrition-stress-tolerance/*.

[8] *https://geneticliteracyproject.org/2017/10/26/crispr-crop-disease-resistant-ge-cassava-staple-crap-could-help-tackle-hunger-africa/*.

[9] *https://geneticliteracyproject.org/2016/09/08/crispr-corn-duponts-non-transgenic-drought-tolerant-gene-edited-corn-sale-soon/*.

[10] *https://news.psu.edu/story/405406/2016/04/19/research/gene-edited-mushroom-created-penn-state-researcher-changing-gmo*.

[11] *https://theecologist.org/2016/jan/13/gm-20-gene-editing-produces-gmos-must-be-regulated-gmos*.

[12] *https://www.the-scientist.com/news-opinion/no-regulatory-exemption-for-gene-edited-products-in-eu-64562*.

[13] *https://geneticliteracyproject.org/2019/05/22/eu-commission-prepares-for-possible-overhaul-of-gmo-crop-rules-to-address-crispr-gene-editing/*.

ical movement and are trying to stifle technology that is advancing sustainable farming.

GMO debate, part 2

The EU's stringent stance on crop gene editing, though a serious blow to scientific progress, is the exception to the rule, as most developed countries—including *Canada, Australia, Argentina and the U.S.*[14]—have concluded that NBTs should not be regulated as strictly as GMO crops. The reason for this light regulatory approach, *according to the U.S. Department of Agriculture*[15] (USDA), is that gene-edited crops:

> *. . . are indistinguishable from those developed through traditional breeding methods. The newest of these methods, such as genome editing, expand traditional plant breeding tools because they can introduce new plant traits more quickly and precisely, potentially saving years or even decades in bringing needed new varieties to farmers.*

The fact that gene editing is essentially accelerated plant breeding (and EU regulators *can't distinguish*[16] gene-edited and traditionally bred crops) doesn't seem to matter to many organic proponents, who are using the same playbook to attack gene-edited crops they utilized to demonize GMOs. They suggest, usually without evidence, that gene editing poses some unanticipated threat, leaving the reader to fill in the gaps. The organic industry-funded Center for Food Safety (CFS) rehashed this decades-old argument to attack CRISPR-edited corn in *a recent blog post:*[17]

> *Despite growing concerns about the possible impacts of synthetic biology organisms on human health and the environment and a lack of independent safety assessment, the U.S. Food and Drug Administration has allowed . . . DuPont's CRISPR waxy corn and other similarly created food and cosmetic ingredients to enter the market without regulation.*

Such arguments rely on carefully selected, often preliminary studies, while *ignoring the overwhelming research*[18] addressing safety and environmental concerns about gene-editing. Nonetheless, CFS is not alone. The National Organic Coalition (NOC), whose membership includes *prominent anti-GMO groups*[19] Beyond Pesticides, Consumers Union and indeed CFS, has likewise said it firmly opposes the use of gene editing, what it calls "*next generation GMOs*[20]":

> *Genetic Engineering and Genetic Modification Organisms are not a part of organic production. NOC is currently advocating to clarify the prohibition for next generation GMOs in organic production and we are advocating for transparent labeling of genetically engineered crops.*

Biomedicine: The Anti-GMO machine's blind spot

On their own terms, such fear-based arguments are unimpressive. But there's a bigger problem with the organic movement's opposition to GMO and gene-edited crops. The *same biotech tools*[21] that can be used to develop disease-resistant plants also have important biomedical applications, yet the anti-GMO machine doesn't seem too concerned about these. Some activist groups, like *Organic Consumers Association*[22] and *Moms Across America,*[23] reject vaccines. By and large, though, the anti-biotech campaigners have been careful to avoid discussing biomedicine.

---

[14] *https://geneticliteracyproject.org/2018/11/07/13-nations-say-its-time-to-end-political-posturing-and-embrace-crop-gene-editing/*

[15] *https://www.usda.gov/media/press-releases/2018/03/28/secretary-perdue-issues-usda-statement-plant-breeding-innovation.*

[16] *https://reason.com/2019/07/23/e-u-regulators-cant-detect-the-gene-edited-crops-they-banned/.*

[17] *https://www.centerforfoodsafety.org/press-releases/4579/organic-standards-will-exclude-next-generation-of-gmos.*

[18] *https://gmo.geneticliteracyproject.org/FAQ/whats-difference-mutagenized-crops-gmos-gene-edited-crops/.*

[19] *https://www.nationalorganiccoalition.org/member-organizations.*

[20] *https://www.nationalorganiccoalition.org/genetic-engineering.*

[21] *https://gmo.geneticliteracyproject.org/FAQ/why-is-there-controversy-over-gmo-foods-but-not-gmo-drugs/.*

[22] *https://geneticliteracyproject.org/glp-facts/organic-consumers-association-2/.*

[23] *https://geneticliteracyproject.org/glp-facts/moms-across-america-consumer-group-promotes-health-scares-targets-gmos-chemicals/.*



Insulin injection. Image: Xain Storey.

The Sierra Club, though referring to CRISPR as "a weapon of mass destruction," has made it clear that it has no issue with biotechnology in medicine. "We call for a ban on the planting of all genetically engineered crops," the group's *biotechnology position statement*[24] reads. However, "[o]ur policy is not intended to be applied to biomedical applications." There's a good reason for this inconsistent opposition. The medical applications of biotechnology have had a visible impact on public health, and consumers haven't opposed them as a result. The anti-GMO activists were *forced to abandon*[25] their early attack on medical biotech applications because of these treatments dramatically improved people's lives.

In the 1970s, for instance, diabetics faced the looming threat of an *insulin shortage.*[26] They don't today because the drug is mass produced with the help of genetically modified bacteria, which ensures a steady supply. A similarly inspiring story can be told about life-saving vaccines. The *Ebola vaccine*[27] being used to contain the infectious disease in the Democratic Republic of the Congo and the HPV vaccine, which could potentially *eradicate cervical cancer,*[28] are also excellent examples of genetically engineered pharmaceuticals whose impact can't be dismissed.

Why crop biotech became the bogeyman

Despite their inconsistency, organic activists have successfully attacked agricultural biotechnology because it *primarily benefits farmers,*[29] in the form of higher crop yields and lower production costs. And since the public knows *next to nothing*[30] about farming, anti-GMO groups were able to sell consumers on the idea that biotech crops are not "natural" and thus harmful in some way. What they have ignored or failed to grasp is that there is nothing natural about farming. As Maarten Chrispeels, Distinguished Professor Emeritus at the University of California, San Diego, *has pointed out:*[31]

---

[24] *https://www.sierraclub.org/policy/biotechnology*.
[25] *https://gmo.geneticliteracyproject.org/FAQ/why-is-there-controversy-over-gmo-foods-but-not-gmo-drugs/*.
[26] *https://geneticliteracyproject.org/2017/10/30/genetic-engineering-came-age-worlds-first-gmo-ge-insulin-approved-35-years-ago/*.
[27] *https://www.sciencemag.org/news/2019/05/drc-expands-ebola-vaccine-campaign-cases-mount-rapidly*.
[28] *https://www.bmj.com/content/365/bmj.l4450*
[29] *https://gmo.geneticliteracyproject.org/FAQ/why-is-there-controversy-over-gmo-foods-but-not-gmo-drugs/*.
[30] *https://geneticliteracyproject.org/2019/05/28/as-consumers-become-more-and-more-detached-from-farming-ignorance-about-modern-agriculture-and-gmos-grows/*.
[31] *https://biology.ucsd.edu/about/news/article_061604.html*.



An agricultural landscape may look attractive—a vineyard in the San Diego backcountry for example, or a sunflower field in full bloom in the Provence in France—but its creation required the complete destruction of the natural ecosystem and its replacement by an agricultural ecosystem. Further, to grow so many of the same plants in one field while at the same time suppressing the growth of other plants—in this case, weeds—is not natural.

The simple fact is that none of the foods we consume are natural: They all have been *developed* [32] through centuries of plant breeding. Seedless grapes and watermelons are completely unnatural products. In their original state, wild papayas were round and the size of a plum, while the *antecedents of watermelon* [33] were hard, bitter and pale green in color. In one form or another, humankind has been genetically engineering food for thousands of years. Without such manipulation, we would never have been able to produce the dazzling variety of foods we consume today. Thanks to gene editing, we now have the means to speed up the process.

A few new gene-edited crops are already on the market, such as the *healthier soybean* [34] developed by Minnesota biotech firm Calyxt. This gene-edited crop can be used to produce soybean oil with fewer saturated fats and zero trans fats. Oil from the soybeans is being sold to some restaurants, while Calyxt *works to develop* [35] disease-resistant and high-fiber varieties of wheat, blight-resistant potatoes and drought-tolerant soybeans. Cibus, another firm whose specialty is gene-edited crops, *has produced* [36] a herbicide-tolerant, ultra-high oleic canola, which it has licensed to Valley Oils Partners. Allan Yeap, President of Valley Oils Partners, said of the edited canola:

The oil produced from the ultra-high oleic canola is unique and has exceptional properties making it desirable for use in wide range of applications, including food production, animal feed, restaurant food frying and as a bio-renewable bio-degradable hydraulic oil for trucks and machinery.

What's at stake

The debate over CRISPR and other new breeding techniques isn't merely an academic exercise. If the more radical voices in the organic food movement are successful in further restricting gene editing, they could do great harm to global food production. Climate change and a growing global population represent major threats

---

[32] *https://gmo.geneticliteracyproject.org/FAQ/whats-difference-mutagenized-crops-gmos-gene-edited-crops/.*

[33] *https://news.nationalgeographic.com/2015/08/150821-watermelon-fruit-history-agriculture/.*

[34] *https://reason.com/2019/03/19/gene-edited-soy-oil-now-available/.*

[35] *https://calyxt.com/calyxts-high-fiber-wheat-deemed-non-regulated-by-usda/.*

[36] *https://www.prnewswire.com/news-releases/cibus-licenses-ultra-high-oleic-canola-oil-trait-to-valley-oils-partners-300821616.html.*

to food security. As the World Resources Institute argued in its *recent report,*[37] GMO and gene-edited crops are essential tools if we are going to overcome these challenges.

If the organic food movement wishes to deny itself the benefits that come with embracing modern biotechnology (a subject we'll examine in part two of this series), no one can stand in the way. What is unconscionable, however, is the organic movement's effort to spread falsehoods about genetic engineering and stifle agricultural productivity along the way. Many organic food proponents have learned the age-old lesson that it is easier to scare people than it is to reassure them. We will all be the losers if they succeed in turning the public away from technologies that could revolutionize agriculture.

Steven E. Cerier is a freelance international economist and a frequent contributor to the Genetic Literacy Project.

The GLP featured this article to reflect the diversity of news, opinion and analysis. The viewpoint is the author's own. The GLP's goal is to stimulate constructive discourse on challenging science issues.

ARTICLE 2

Genetic Literacy Project

SCIENCE NOT IDEOLOGY

GENETIC LITERACY PROJECT

https://geneticliteracyproject.org/2019/08/20/viewpoint-organic-food-movement-shoots-itself-in-the-foot-by-rejecting-crispr-gene-editing/

Viewpoint: **Organic food movement 'shoots itself in the foot' by rejecting CRISPR gene editing**

STEVEN CERIER (*https://geneticliteracyproject.org/writer/steven-cerier/*) |August 20, 2019



Image: iStock.

The organic food movement has declared its strong opposition to new plant breeding techniques (NBTs) such as CRISR-Cas9 gene editing, arguing they are unnatu-

[37] *https://geneticliteracyproject.org/2019/07/18/viewpoint-we-need-gmo-crispr-edited-crops-to-help-feed-10-billion-people/*

ral and potentially harmful to the environment and human health. As we discussed in part one of this series, organic farmers, retailers and their trade groups have begun to utilize the same playbook to vilify gene-edited crops they use against genetically modified (GMO) crops. This opposition to the latest advances in plant breeding illustrates the organic movement's disdain for mainstream science and its precautionary mindset about agriculture. But there's another related development worth exploring in detail.

[Editor's note: This article is part one of a four-part series on the organic food industry's reaction to the introduction of gene-edited crops. Read part *one,*† [1] part *three* [2] and part *four*.[4]] ‡

While most organic food producers view rejection of technology as a way to set their "natural" products apart from the conventional alternatives, they have miscalculated the importance of plant breeding advances and may put themselves at a severe competitive disadvantage as a result. NBTs are beginning to radically improve food production, yielding products that appeal to both consumers and farmers. This feat cannot be replicated by organic growing practices.

The gene-editing revolution

New breeding techniques *encompass dozens* [4] of gene-editing and gene-silencing technologies that allow scientists to make very specific modifications to the genomes of food crops and animals, endowing them with a variety of useful traits. These tools were in development for decades and finally burst onto the scene in 2005 when scientists *used the technology* [5] to edit tobacco plants. Since then, researchers worldwide have begun developing *hundreds of crops* [6] using these technologies, some of which have already hit the market.

The agricultural advances now within reach are almost startling. New plant breeding technologies, CRISPR being the best known, have the potential to eradicate serious plant diseases, eliminating a large percentage of the crop losses that farmers suffer every year.

---

† **Editor's note:** due to the numerous instances of hyperlinked text in the following article the hyperlinks are reformatted, herein, as footnotes.

[1] *https://geneticliteracyproject.org/2019/08/06/viewpoint-dissecting-the-fear-based-case-against-gene-edited-crops-in-organic-farming/*.

[2] *https://geneticliteracyproject.org/2019/09/24/viewpoint-how-organic-industry-opposition-to-crispr-gene-editing-encourages-pesticide-use/*.

[3] *https://geneticliteracyproject.org/2019/10/22/viewpoint-arriva%E2%80%A6anic-agriculture/*.

‡ **Editor's note:** the hyperlink for *part 4* of the series, as posted on the Genetic Literacy Project's website is incorrect. The correct hyperlink is *https://geneticliteracyproject.org/2019/10/22/viewpoint-arrival-of-gmo-gene-edited-biofortified-crops-weakens-case-for-organic-agriculture/*.

[4] *https://gmo.geneticliteracyproject.org/FAQ/what-is-crisprcas9-and-other-new-breeding-technologies-nbts/*.

[5] *http://www.ijdb.ehu.es/web/paper.php?doi=130194hp*.

[6] *https://geneticliteracyproject.org/2019/06/27/the-first-gene-edited-soybean-opens-door-to-a-slew-of-new-crispr-foods/*.



Citrus greening disease has infected orchards in Florida and around the world. Image: Edgloris Marys/*shutterstock.com*.

The bacterial disease *citrus greening,*[7] for example, has devastated the orange industry in Florida. From a high of 244 million boxes in the 1997–1998 growing year, orange production plunged to 94.2 million boxes in 2015–2016. It is estimated that citrus greening reduced revenues from orange and grapefruit production by $4.64 billion since the disease was detected, costing $1.76 billion in labor income and more than 3,400 jobs. Wheat rust in the U.S. likewise costs farmers an *estimated $5 billion*[8] in lost crops every year.

Scientists are working on gene-editing solutions to both diseases. With respect to citrus greening, *scientists have determined*[9] which genes are "switched on" to express proteins that cause the disease. This insight will hopefully enable them to utilize gene-editing technology to either remove or silence the responsible genes. Scientists have also discovered wheat *genes that are resistant*[10] to the rust pathogen. Gene-editing might be used to "switch on" these genes, potentially endowing wheat with immunity to the disease.

NBTs will also advance the development of biofortified crops to help meet the nutritional needs of developing nations, as well as *drought-tolerant crops*[11] that will help agriculture adapt to the hostile impacts of climate change. The environmental benefits don't stop there, however. Non-browning fruits and vegetables, such as the Arctic Apple, will help tackle the world's food waste problem. And gene-edited crops capable of *fixing nitrogen*[12] from the atmosphere could reduce the use of harmful chemical fertilizers.

Organic industry shoots itself in the foot

Critics of gene-editing have simply recycled the same arguments they leveled at GMOs beginning in the 1990s. In doing so, they have repeatedly ignored evidence that gene-edited food *is safe for human and animal consumption*[13] and poses no threat to the environment. Instead, the organic food industry has conjured up nonexistent dangers and employed scaremongering tactics to frighten the public. Ac-

---

[7] *https://www.orlandosentinel.com/opinion/os-ed-bacteria-greening-hurts-florida-citrus-20170615-story.html*

[8] *https://aglifesciences.tamu.edu/rootbiome/wp-content/uploads/sites/38/2015/06/2016-Ficke-et-al-CropLosses-FoodSecurity-Research-gate.pdf*

[9] *https://www.scientia.global/orange-innovation-creating-citrus-disease-resistance/*.

[10] *https://www.nature.com/articles/s41477-018-0236-4*

[11] *https://geneticliteracyproject.org/2018/11/20/argentina-could-be-first-country-to-plant-gmo-wheat-engineered-for-drought-resistance-if-regulators-approve/*.

[12] *https://allianceforscience.cornell.edu/blog/2018/07/10-ways-crispr-will-revolutionize-environmental-science/*.

[13] *https://www.sciencemag.org/news/2019/03/gene-edited-foods-are-safe-japanese-panel-concludes*.

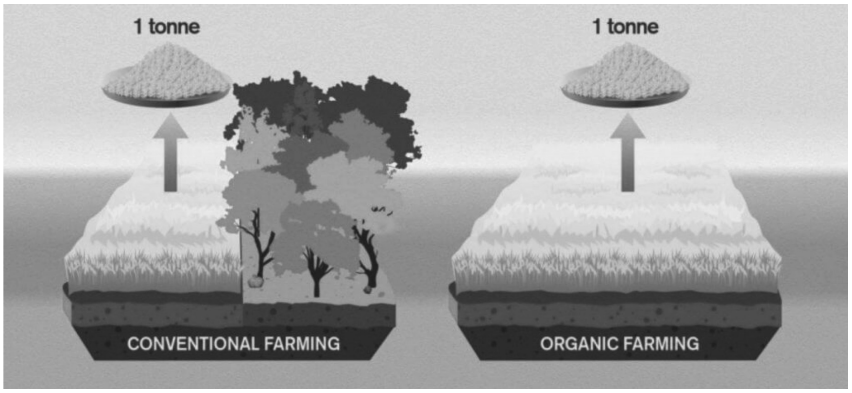
cording to Emma Hockridge, head of policy, farming and land use at the UK's Soil Association, *a pro-organic NGO:* [14]

> *Scientific research has long shown that these new gene-editing technologies give rise to similar uncertainties and risks as GM always has . . . We have always been clear that these new plant breeding techniques are GMOs and therefore are banned in organic farming and food . . . The outcome of gene-editing is to manipulate and alter the genome in a laboratory to make a new organism. This is the very definition of genetic engineering, and gene-editing risks introducing similar uncertainties and unintended consequences as genetic modification of DNA.*

The Soil Association is not alone, either. Virtually all the major organic food organizations have indicated that NBTs will never be allowed in the cultivation of organic crops. As the International Federation of Organic Agriculture Movements, which *represents affiliates* [15] in 120 countries, *explained:* [16]

> *"The rapid development and dissemination of new genetic engineering techniques in recent years brings a level of interference in the genetic make-up of the planet's biodiversity, with consequences that remain poorly understood let alone evaluated, which society has never seen before . . . [I]t is not possible to know the full impact of any given genetic engineering process; most of these techniques may trigger numerous off target effects at different steps of their production process and risk is inherent."*

This consensus opposition to gene editing explains why the USDA's National Organic Standards Board voted in *2016* [17] and *2017* [18] to exclude all gene-edited crops from organic certification, viewing the decision as a way to differentiate its products and appeal to biotech—wary consumers. But this marketing strategy doesn't make as much sense as the industry believes.



Organic farming requires more land to reach the crop yields achieved on conventional farms.

Organic farming has no comparable technology at its disposal that matches the already realized and potential benefits of gene-editing, and the industry is already out-produced by the competition. A 2012 study conducted by McGill University indicated that organic yields are *on average 25% lower* [19] than those achieved on conventional farms. A 2018 study *published in* ***Nature,*** [20] which examined greenhouse gas emissions, similarly found that organic growers require much more land to grow the

---

[14] *https://www.gmwatch.org/en/news/latest-news/18500-uk-soil-association-responds-to-george-eustice-on-genome-editing.*
[15] *https://www.ifoam.bio/en/about-us.*
[16] *https://www.ifoam.bio/sites/default/files/position_paper_v01_web.pdf*
[17] *https://geneticliteracyproject.org/2016/11/23/national-organic-standards-board-wants-usda-to-exclude-new-gene-editing-techniques/.*
[18] *https://www.ams.usda.gov/rules-regulations/organic/nosb/recommendations/fall2017.*
[19] *https://www.cnn.com/2012/04/26/world/organic-food-yield/index.html.*
[20] *https://www.nature.com/articles/s41586-018-0757-z.*

same amount of food as their conventional counterparts. This production gap is likely to grow as more *yield-boosting,*[21] gene-edited crops enter the market.

Consumer-focused products

Gene-editing is poised to weaken the multi-billion dollar organic industry on the demand side as well. Currently, organic and conventionally grown foods are *more or less identical*[22] in terms of nutritional value. The only difference between the two is that the organic industry has *successfully pitched*[23] its products to consumers as more natural. But even this subjective distinction may disappear, as gene editing continues to produce crops with qualitative, consumer-focused benefits that organic foods lack.

Minneapolis-based biotech firm Calyxt has already developed a *gene-edited soybean*[24] that produces healthier oil, which made its *restaurant debut*[25] this year. The company also expects to commercialize a *high-fiber wheat*[26] variety in 2020. Amfora, another biotech company, is developing a *high-protein soybean.*[27] Pairwise, a firm *that creates*[28] "new crops and improve existing ones using gene editing," believes the technology could be used to improve taste, increase shelf life, and lengthen the season of availability. As the *Guardian* reported in *July 2018:*[29]

> *'We are interested in making produce more healthy, sustainable and convenient so that people will eat more produce,' Dr Haven Baker, Pairwise's chief business officer, said . . . . Such approaches, said Baker, could not only boost consumers' nutrient intake, but could also reduce food waste and produce adaptations needed to weather climate change: 'We are trying to solve problems that matter to both consumers and the agricultural systems.'*

Conclusion

The U.S. Government's decision not to stymie the progress of NBTs with excessive regulation will lead to a plethora of new gene-edited foods reaching the market over the next decade. These enhanced products will have qualities that are likely to entice consumers. But instead of embracing NBTs, the organic industry has tried to scare the public away from the technology. This strategy worked against GMOs to a certain degree, but extending it to gene-edited crops that directly benefit consumers might cost the organic industry dearly.

Steven E. Cerier is a freelance international economist and a frequent contributor to the Genetic Literacy Project.

The GLP featured this article to reflect the diversity of news, opinion and analysis. The viewpoint is the author's own. The GLP's goal is to stimulate constructive discourse on challenging science issues.

ARTICLE 3

Genetic Literacy Project

SCIENCE NOT IDEOLOGY

GENETIC LITERACY PROJECT

https://geneticliteracyproject.org/2019/09/24/viewpoint-how-organic-industry-opposition-to-crispr-gene-editing-encourages-pesticide-use/

---

[21] *https://www.yield10bio.com/crispr-gene-editing.*

[22] *https://gmo.geneticliteracyproject.org/FAQ/are-organic-foods-healthier-than-conventional-foods-2/.*

[23] *https://www.organicfacts.net/organic-products/organic-food/health-benefits-of-organic-food.html*

[24] *https://www.the-scientist.com/news-opinion/gene-edited-soybean-oil-makes-restaurant-debut-65590.*

[25] *https://www.the-scientist.com/news-opinion/gene-edited-soybean-oil-makes-restaurant-debut-65590.*

[26] *https://www.calyxt.com/products/high-fiber-wheat/.*

[27] *https://www.amforainc.com/news-1-3-19.*

[28] *https://www.theguardian.com/science/2018/jul/19/weird-new-fruits-could-hit-aisles-soon-thanks-to-gene-editing.*

[29] *https://www.theguardian.com/science/2018/jul/19/weird-new-fruits-could-hit-aisles-soon-thanks-to-gene-editing.*

Viewpoint: **How organic industry opposition to CRISPR gene editing encourages pesticide use**

STEVEN CERIER (*https://geneticliteracyproject.org/writer/steven-cerier/*) | September 24, 2019



Farmers in Spain applying copper sulfate pesticide. Image: Robert Harding

The increasing popularity of organic food is driven largely by consumers hoping to avoid pesticide exposure. When the Soil Association, a UK-based organic advocacy group, asked consumers why they didn't buy conventional foods, *95 percent of them* † [1] said they did so because of pesticides. Despite the fact that organic growers do indeed utilize pesticides—some of which can be very harmful to human health and wildlife—the organic food movement has done its utmost to promote the myth of chemical-free "natural" agriculture, contrasting it with the idea that conventional farmers rely on a bevy of "toxic" substances to grow their crops. Organic Consumers Association (OCA) International Director Ronnie Cummins summed up this false dichotomy in a 2014 article for *EcoWatch:* [2]

> *Organic farming prohibits the use of toxic pesticides, antibiotics, growth hormones and climate-destabilizing chemical fertilizers . . . Consumers are concerned about purchasing foods with high nutritional value and as few as possible synthetic or non-organic ingredients. Organic foods are nutritionally dense compared to foods produced with toxic chemicals, chemical fertilizers and GMO seeds.*

† **Editor's note:** due to the numerous instances of hyperlinked text in the following article the hyperlinks are reformatted, herein, as footnotes.

[1] *https://blogs.scientificamerican.com/science-sushi/httpblogsscientificamericancomscience-sushi20110718mythbusting-101-organic-farming-conventional-agriculture/.*

[2] *https://www.ecowatch.com/10-reasons-consumers-buy-organic-1881899943.html.*

[3] *https://geneticliteracyproject.org/2019/08/06/viewpoint-dissecting-the-fear-based-case-against-gene-edited-crops-in-organic-farming/.*

[Editor's note: This article is part one of a four-part series on the organic food industry's reaction to the introduction of gene-edited crops. Read part *one,*[3] part *two*[4] and part *four.*[5]] ‡

Although synthetic pesticides are generally not allowed in organic farming, "natural" substances that control pests are not only permitted but required, because bugs will eat organic and conventional crops without hesitation. Cummins doesn't include that important clarification, though the problem with his argument isn't so much the sleight of hand but that it's at complete odds with reality.



As crop biotechnology continues to advance, conventional farmers are gaining access to new tools that drastically cut pesticide use. This downward trend in chemical dependency goes back to the introduction of genetically modified (GM) crops in the 1990s, and will only accelerate as more gene-edited crops and animals reach the market in the near future. The organic industry, meanwhile, continues to sit out this sustainability revolution for *ideological and economic*[6] reasons, which ultimately encourages pesticide use.

Mother Nature's toxic chemicals

There is a common misconception that natural substances are inherently safer than the chemicals scientists synthesize in the lab, leading to the belief that synthetic pesticides used in conventional agriculture must pose an elevated threat to human health. The organic movement has found this misconception helpful in its crusade against modern farming techniques, even in the face of evidence that both *synthetic and natural pesticides*[7] can be toxic. According to Charlotte Vallaeys, food and farm policy director at the Cornucopia Institute, a nonprofit *organic activist group:*[8]

> *There was just no way that truly independent scientists . . . would ignore the vast and growing body of scientific literature pointing to serious health risks from eating foods produced with synthetic chemicals.*

What the Cornucopia Institute seems less eager to discuss is the long list of *USDA-approved substances*[9] that can be used in organic farming. Some of the products would surprise many organic food consumers, since these chemicals can be dangerous. Lime sulfur, for instance, is used to control fungi, bacteria and insects living

---

[1] *https://blogs.scientificamerican.com/science-sushi/httpblogsscientificamericancomscience-sushi20110718mythbusting-101-organic-farming-conventional-agriculture/.*

[2] *https://www.ecowatch.com/10-reasons-consumers-buy-organic-1881899943.html.*

[3] *https://geneticliteracyproject.org/2019/08/06/viewpoint-dissecting-the-fear-based-case-against-gene-edited-crops-in-organic-farming/.*

[4] *https://geneticliteracyproject.org/2019/08/20/viewpoint-organic-food-movement-shoots-itself-in-the-foot-by-rejecting-crispr-gene-editing/.*

[5] *https://geneticliteracyproject.org/2019/10/22/viewpoint-arriva%E2%80%A6anic-agriculture/.*

‡ **Editor's note:** the hyperlink for *part 4* of the series, as posted on the Genetic Literacy Project's website is incorrect. The correct hyperlink is *https://geneticliteracyproject.org/2019/10/22/viewpoint-arrival-of-gmo-gene-edited-biofortified-crops-weakens-case-for-organic-agriculture/.*

[6] *https://geneticliteracyproject.org/2019/08/20/viewpoint-organic-food-movement-shoots-itself-in-the-foot-by-rejecting-crispr-gene-editing/.*

[7] *https://geneticliteracyproject.org/2019/07/08/twist-upon-twist-in-glyphosate-battle-next-generation-safer-biopesticides-on-the-way-thanks-in-part-to-anti-chemical-activists%E2%81%A0-who-may-yet-oppose-them/.*

in or dormant on the surface of bark of deciduous trees, which lose their leaves seasonally.

Lime sulfur solutions are highly alkaline and *corrosive to living things;*[10] they can cause blindness through eye contact. Organic farmers growing apples and pears whose orchards are infected with fire blight can use peracetic acid to control infestation. Exposure to *peracetic acid*[11] can cause irritation to the skin, eyes and respiratory system; high acute and long-term exposure can cause permanent lung damage. There have been cases of *occupational asthma*[12] resulting from the use of peracetic acid. Boric acid powder can also be used in organic farming for pest control, as long as it does not come into direct contact with crops. It is poisonous if ingested and long-term exposure can cause *kidney damage.*[13]



Fungicide copper sulfate is popular with organic farmers.
[*https://www.shutterstock.com/image-photo/tomatoes-sprinkled-copper-sulphate-traditional-old-705380473?src=kzVhukZ_cwJ4hH0AMphyUg-1-6*]

Copper sulfate can also be used in organic farming as a fungicide, and is extensively utilized in grape orchards. According to the *EPA,*[14] "DANGER" must appear on the labels of all copper sulfate products that contain 99% active ingredient in crystalline form. Cornell University's Toxicology Network summary of copper sulfate poisoning explains *why that is:*[15]

> *Some of the signs of poisoning, which occur after 1–12 grams of copper sulfate are swallowed, include a metallic taste in the mouth, burning pain in the chest and abdomen, intense nausea, vomiting, diarrhea, headache, sweating and shock . . . Injury to the brain, liver, kidneys and stomach and intestinal linings may also occur in copper sulfate poisoning. Copper sulfate can be corrosive to the skin and eyes . . . Copper sulfate is very toxic to fish . . . Direct application of copper sulfate to water may cause a significant decrease in populations of aquatic invertebrates, plants and fish.*

The EU has deemed copper fungicides to be such a potential hazard to humans and the environment that it is phasing them out. In October 2018, the European Food Safety Authority released fresh data *that re-affirmed*[16] the toxicity of copper compounds that are used in organic farming. In October 2018, the European Union (EU) noted:

---

[10] *http://davismfg.com/resources/uploads/Lime Sulfur Dip.pdf.*
[11] *https://chemdaq.blogspot.com/2011/01/peracetic-acid-uses-health-risks.html.*
[12] *https://academic.oup.com/occmed/article-abstract/69/4/294/5420724?redirectedFrom=fulltext.*
[13] *http://apjmt.mums.ac.ir/article_2041_6e5584bf58f2150503d4311b09cabaf0.pdf.*
[14] *http://pmep.cce.cornell.edu/profiles/extoxnet/carbaryl-dicrotophos/copper-sulfate-ext.html*
[15] *http://pmep.cce.cornell.edu/profiles/extoxnet/carbaryl-dicrotophos/copper-sulfate-ext.html.*
[16] *https://www.euractiv.com/section/agriculture-food/news/efsa-re-confirms-toxicity-of-organic-pesticide-exposes-pest-committee-boss/.*

Copper compounds, including copper sulfate, are authorized in the EU as bactericides and fungicides, even though it is a substance of particular concern to public health or the environment, according to the European Food Safety Authority (EFSA). Copper compounds are candidates for substitution and their use is being phased out and replaced.

Biotechnology exposes a bigger problem

The organic food movement has a bigger problem than the obvious double standard it relies on to attack synthetic chemicals. Biotechnology has drastically cut pesticide use over the past 25 years. But since activists like OCA's Cummins also oppose crop biotech, they have twisted themselves in knots trying to justify two clearly contradictory positions.

For example, one of the most common insecticides used in organic farming is *Bacilllus thuringiensis* (Bt), a natural bacterium found in the soil. Yet when Bt is spliced into a seed to create genetically modified corn, soybean, cotton and brinjal (a type of eggplant), the organic movement vehemently objects, claiming that these insect-resistant crops are dangerous to human health and the environment. Both claims have been *thoroughly debunked* [17] by years of research.

Instead of criticizing GM Bt crops, the organic movement should be applauding their cultivation, which has led to a substantial reduction in the use of pesticides. Farmers in India who grow Bt cotton, for example, have seen their use of pesticides decline by *more than 60 percent.*[18] A *June 2019 study* [19] on the introduction of Bt brinjal in Bangladesh similarly noted the crop "provides essentially complete control of the eggplant fruit and shoot borer, dramatically reduces insecticide sprays, provides a six-fold increase in grower profit, and does not affect non-target arthropod biodiversity." Overall, GM crops are responsible for a *37 percent decline* [20] in pesticide use worldwide, and the widespread adoption of Bt technology has been an enormous part of that development.

Other biotech innovations are poised to cut agricultural pesticide use even more. New gene-editing technologies such as CRISPR may enable researchers to manipulate the genetics of insect populations to provide a chemical-free pest control method. University of California, San Diego researchers explored one possible approach in a *January 2019 study:* [21]

Using the CRISPR gene-editing tool, researchers have developed a new way to control and suppress populations of insects, potentially including those that ravage agricultural crops and transmit deadly diseases. The precision-guided sterile insect technique (PGSIT) alters key genes that control insect sex determination and fertility. When PGSIT eggs are introduced into targeted populations, only adult sterile males emerge resulting in a novel, environmentally friendly and relatively low-cost method of controlling pest populations in the future.

Editing the genome of insects that damage important crops and fortifying the natural defenses of plants could allow farmers to markedly reduce pesticide use. CRISPR-edited apples *can be protected* [22] against fire blight disease, for instance, without the use of peracetic acid. The organic food movement should welcome such developments, but it continues to oppose them because of scientifically unwarranted concerns that crop biotechnology might be hazardous to human health and the environment.

Ideological considerations, like *extreme distrust of corporations,*[23] partially explain why anti-GM activists continue to perpetuate unfounded fears of genetic modification and mislead the public about the use of pesticides in organic farming. But economics offers some insight as well, as the organic food movement needs to justify the high cost of organically grown food. It does so by disparaging conventionally grown and genetically engineered crops by raising non-existent health and environmental concerns.

---

[17] *https://gmo.geneticliteracyproject.org/FAQ/bt-insect-resistant-crops-pose-threat-human-health-environment/.*

[18] *https://modernag.org/innovation/bt-agricultures-rock-star/.*

[19] *https://cshperspectives.cshlp.org/content/early/2019/06/10/cshperspect.a034678.abstract.*

[20] *https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5790416/.*

[21] *https://www.sciencedaily.com/releases/2019/01/190108084430.htm.*

[22] *https://geneticliteracyproject.org/2019/09/11/crispr-gene-editing-inoculates-apples-against-orchard-destroying-fire-blight-disease/.*

[23] *https://geneticliteracyproject.org/2019/07/08/twist-upon-twist-in-glyphosate-battle-next-generation-safer-biopesticides-on-the-way-thanks-in-part-to-anti-chemical-activists%E2%81%A0-who-may-yet-oppose-them/.*

According to former Secretary of Agriculture *Dan Glickman,*[24] "the organic label is a marketing tool. It is not a statement about food safety. Nor is organic a value judgment about nutrition or quality." Such a fact is clear to anyone who takes the time to look at the evidence. Molecular biologist Louis Hom offers an important explanation of why many in the organic movement are so reluctant to acknowledge the veracity of *Glickman's uncontroversial statement:*[25]

> *For obvious reasons, organic farmers have done little, if anything, to dispel the myth that organic = chemical/pesticide-free. They would only stand to lose business by making such a disclosure.*

Steven E. Cerier is a freelance international economist and a frequent contributor to the Genetic Literacy Project.

The GLP featured this article to reflect the diversity of news, opinion and analysis. The viewpoint is the author's own. The GLP's goal is to stimulate constructive discourse on challenging science issues.

ARTICLE 4

Genetic Literacy Project

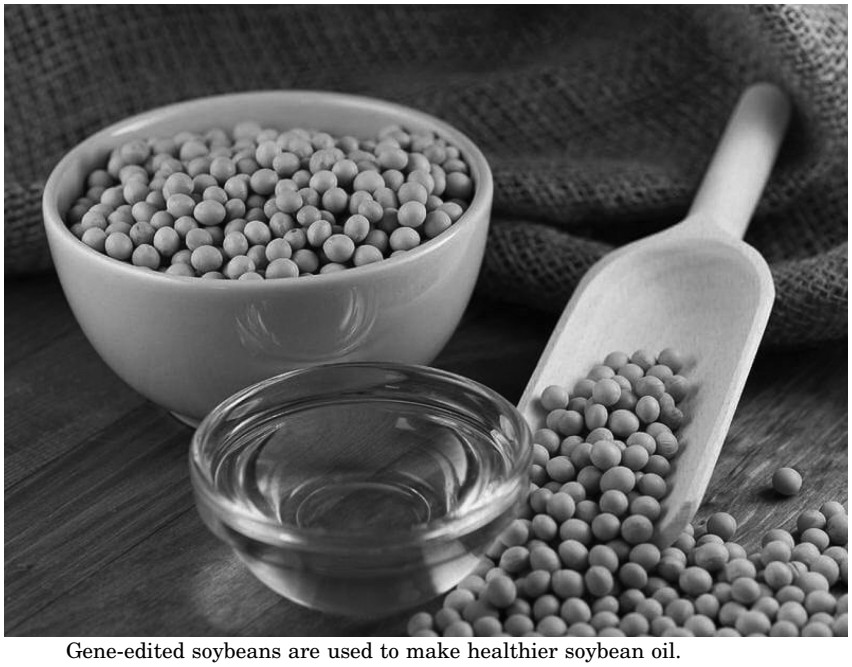
SCIENCE NOT IDEOLOGY

GENETIC LITERACY PROJECT

https://geneticliteracyproject.org/2019/10/22/viewpoint-arrival-of-gmo-gene-edited-biofortified-crops-weakens-case-for-organic-agriculture/

Viewpoint: **How organic industry opposition to CRISPR gene editing encourages pesticide use**

STEVEN CERIER (*https://geneticliteracyproject.org/writer/steven-cerier/*) | October 22, 2019



Gene-edited soybeans are used to make healthier soybean oil.

[24] *https://geneticliteracyproject.org/2014/05/16/former-us-secretary-of-agriculture-glickman-criticizes-organic-industry-for-misleading-marketing/*.

[25] *https://www.ocf.berkeley.edu/~lhom/organictext.html*.

The organic food industry has grown rapidly in recent years. According to the *Organic Trade Association,*† [1] organic food sales rose by 125.1% between 2009 and 2018 to $47.862 billion and accounted for 5.9% of total food sales. One of the major reasons for this stellar expansion is the misconception, propagated by the industry itself, that organic foods are healthier and more nutritious than conventionally grown foods.

A *2018 Pew Survey, for example, noted:* [2]

> *[Y]ounger people remain more likely than their older counterparts to say organics are healthier than conventionally grown food. Some 54% of those ages 18 to 29 and 47% of those ages 30 to 49 believe organic fruits and vegetables are generally better for one's health, compared with 39% of those 65 and older who say the same.*

While anti-biotech activists cling to the myth that organic food is healthier and more nutritious than conventionally grown food, genetic engineering—fervently opposed by most organic advocates—is yielding a new lineup of *GMO* [3] and gene-edited crops with nutrient content organic growers simply can't replicate. One such product has already hit the market and several others are expected to follow in the next few years. This development has exposed a nutrition gap between organic and genetically engineered crops and further weakened the case for organic farming.

> **[Editor's note: This article is part one of a four-part series on the organic food industry's reaction to the introduction of gene-edited crops. Read part *one,*[4] part *two* [5] and part *three.*[6]]**

Organic food and nutrition: the evidence so far



[*https://www.turfcaresupply.com/blog/2018/09/14/the-glyphosate-debate*]

Anti-biotech activists often base their claim that organic food is healthier on the prohibition of synthetic pesticide use in organic farming. Ronnie Cummins, director of the Organic Consumers Association, has asserted that *conventional farming* [7] "means chemical, conventional means toxic and that this whole myth of using genetic engineering in agriculture is actually dangerous to our health . . . ." The Rodale Institute, the self-described "birthplace" of organic agriculture, shares Cummins view, but is more forthcoming about the state of the science, *noting in 2012:* [8]

> *We have little long-term research on the health impacts of chronic, low-level pesticide exposures. And the research that is out there is troubling. Exposure to*

---

† **Editor's note:** due to the numerous instances of hyperlinked text in the following article the hyperlinks are reformatted, herein, as footnotes.

[1] *https://www.foodbusinessnews.net/articles/13805-us-organic-food-sales-near-48-billion.*

[2] *https://www.pewresearch.org/fact-tank/2018/11/26/americans-are-divided-over-whether-eating-organic-foods-makes-for-better-health/.*

[3] *https://geneticliteracyproject.org/2018/12/07/viewpoint-parents-anti-gmo-fervor-just-might-contribute-to-childrens-allergies/.*

[4] *https://geneticliteracyproject.org/2019/08/06/viewpoint-dissecting-the-fear-based-case-against-gene-edited-crops-in-organic-farming/.*

[5] *https://geneticliteracyproject.org/2019/08/20/viewpoint-organic-food-movement-shoots-itself-in-the-foot-by-rejecting-crispr-gene-editing/.*

[6] *https://geneticliteracyproject.org/2019/09/24/viewpoint-how-organic-industry-opposition-to-crispr-gene-editing-encourages-pesticide-use/.*

[7] *https://responsibleeatingandliving.com/favorites/ronnie-cummins-interview/.*

[8] *https://rodaleinstitute.org/blog/is-organic-worth-the-media-buzz/.*

these toxins has been linked to brain and central nervous system disruption, infertility, cancer, and even changes to our DNA . . .

The fact is, nutrition research on organic foods is very much in its infancy. The "literature lacks strong evidence that organic foods are significantly more nutritious than conventional food," as [the authors of a 2012 study] concluded, partly because there is very little research to speak of . . .

The claim that pesticide residues on conventional crops pose a health risk is not well supported by the evidence, which is *quite extensive.*[9] And while there have been some studies that suggest organic foods may have higher *levels of antioxidants,*[10] the vast bulk *of the studies*[11] comparing *organic*[12] and conventionally produced foods have concluded that there are no significant nutritional differences between the production methods. One of the most extensive studies comparing the nutritional content of organic and conventionally grown foods was conducted by *Stanford University in 2012.*[13] The university explained following the study's publication:

Analyzing the data, the researchers found little significant difference in health benefits between organic and conventional foods. No consistent differences were seen in the vitamin content of organic products, and only one nutrient—phosphorus—was significantly higher in organic ***versus*** *conventionally grown produce (and the researchers note that because few people have phosphorous deficiency, this has little clinical significance). There was no difference in protein or fat content between organic and conventional milk, though evidence from a limited number of studies suggested that organic milk may contain significantly higher levels of omega-3 fatty acids.*

Harvard Medical School likewise *noted in 2015:*[14]

While organic foods have fewer synthetic pesticides and fertilizers and are free of hormones and antibiotics, they don't appear to have a nutritional advantage over their conventional counterparts.

Kathy McManus, director of the Department of Nutrition at Brigham and Women's Hospital, told Harvard that "there've been a number of studies examining the macro and micronutrient content, but whether organically or conventionally grown, the foods are really similar in vitamins, minerals and carbohydrates."

---

[9] *https://geneticliteracyproject.org/2019/09/18/pesticide-residues-on-vast-majority-of-foods-well-below-legal-limits-new-fda-data-show/.*

[10] *https://www.npr.org/sections/thesalt/2016/02/18/467136329/is-organic-more-nutritious-new-study-adds-to-the-evidence.*

[11] *https://www.health.harvard.edu/staying-healthy/should-you-go-organic.*

[12] *https://geneticliteracyproject.org/2017/05/25/5-reasons-hard-know-whether-organic-food-really-organic/.*

[13] *https://med.stanford.edu/news/all-news/2012/09/little-evidence-of-health-benefits-from-organic-foods-study-finds.html.*

[14] *https://www.health.harvard.edu/staying-healthy/should-you-go-organic.*

Genetic engineering produces more nutritious food



A regular banana (right) compared to a golden banana (left). Thanks to the increased level of beta-carotene, the banana has a golden cream color.

A wide variety of crops, including genetically modified *bananas,*[15] *sorghum,*[16] *cassava*[17] and *potatoes,*[18] have been created to address vitamin A deficiency, which according to the *World Health Organization*[19] (WHO) effects an estimated 250 million preschool children—between 250,000 and 500,000 of whom become blind every year. Half of them die within twelve months of losing their sight. Genetic engineering can significantly dent those numbers by producing crops high in beta carotene, which is converted into Vitamin A once consumed.

Golden rice[20] is the best-known example of a Vitamin A-enriched crop. It has been in development for over 2 decades and is finally approaching commercialization in parts of the world where it can make the biggest impact. Hopefully sometime this year, *Bangladesh*[21] will be the first country to cultivate the crop. The *Philippines*[22] is expected to follow shortly thereafter.

Nuseed,[23] a subsidiary of Nufarm, Ltd. of Australia, received approval in August 2018 from the USDA to begin planting its GMO omega-3 canola. The crop is produced by taking genes from microalgae and inserting them into canola seeds, thereby enabling the plant to produce Docosahexaenoic acid (DHA), which supports eye health, brain function and may prevent a variety of diseases, including heart disease. This fatty acid is found in the meat of cold-water fish, and Nuseed estimates that 1 hectare of its canola could provide the omega-3 equivalent of *10,000 kg of wild caught*[24] fish.

The oil from these genetically modified plants can be used for food and animal feed once the FDA grants regulatory approval, which Nuseed expects to receive

---

[15] *https://www.newsweek.com/scientists-orange-bananas-vitamin-uganda-633136.*

[16] *https://geneticliteracyproject.org/2017/03/02/african-scientists-developing-gmo-sorghum-higher-levels-vitamin-tackle-childhood-blindness/.*

[17] *https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0179427.*

[18] *https://www.genengnews.com/topics/translational-medicine/gmo-potatoes-provide-improved-vitamin-a-and-e-profiles/.*

[19] *https://www.who.int/nutrition/topics/vad/en/.*

[20] *http://www.goldenrice.org/.*

[21] *https://geneticliteracyproject.org/2019/03/05/golden-rice-is-coming-finally-will-it-be-the-game-changer-hinted-at-for-almost-20-years/.*

[22] *https://www.manilatimes.net/gmo-crops-gaining-ground/558432/.*

[23] *https://www.fooddive.com/news/usda-approves-gm-omega-3-canola-for-us-cultivation/531248/.*

[24] *https://www.foodnavigator-usa.com/Article/2018/05/24/Omega-3s-from-plants-This-technology-is-going-to-have-a-massive-impact-on-the-industry.*

sometime in 2019. Food giant Cargil[l] in genconjunction with BASF is also working on an *omega-3 canola* [25] which it hopes to bring to the market in 2020.

CRISPR widens the gap



[*http://www.neolifeclinic.com/blog/gluten-is-not-the-only-culprit-other-wheat-proteins-are-also-to-blame/?lang=en*]

New breeding techniques, including *CRISPR,* [26] are beginning to yield a wide variety of more nutritious foods as well. Among the companies at the forefront of the crop gene-editing revolution is Minneapolis-based Calyxt. In April, the biotech firm announced its first sale of *gene-edited soybean oil* [27] for commercial use to a Midwestern restaurant chain. The oil is used for frying, in salad dressing and sauces and is made from soybeans that have been edited to produce high-oleic oil with no trans-fat and less saturated fat. These nutritional traits, the company notes, prolong the oil's shelf life and make it a competitor to healthy oils from olive, sunflower and safflower. Calyxt has also developed a gene-edited, high-fiber wheat, which may be on the market in 2020. According to Jim Blome, *CEO of Calyxt:* [28]

> *Consumer demand for high-fiber products has never been higher, as fiber is essential for healthy digestion, with the potential to decrease the risk of food-related diseases like coronary heart disease and diabetes. Most adults only consume about half of the recommended amount of fiber in their diet, but with the latest advancement, we're one step closer to developing a product with up three times more dietary fiber than standard wheat flour.*

Given wheat's status as a staple crop globally, a number of other research projects are underway to improve its nutritional qualities. Scientists at the John Innes Centre in the UK have developed a wheat variety that produces white flour with *more than double* [29] the crop's typical iron content, thus greatly benefiting people with anemia, a medical conditions with *serious complications* [30] in extreme cases. Field trials of the wheat are being conducted between 2019 and 2022. Researchers in

---

[25] *https://www.feednavigator.com/Article/2019/08/09/Cargill-gets-green-light-for-omega-3-producing-canola*.

[26] *https://geneticliteracyproject.org/2019/10/18/genetic-engineering-crispr-food-revolution-will-bring-near-future/*.

[27] *https://www.the-scientist.com/news-opinion/gene-edited-soybean-oil-makes-restaurant-debut-65590*.

[28] *http://www.calyxt.com/calyxt-harvests-high-fiber-wheat-field-trials/*.

[29] *https://geneticliteracyproject.org/2019/05/06/video-john-innes-centre-battles-nutrient-deficiency-with-iron-fortified-biotech-wheat/*.

[30] *https://www.mayoclinic.org/diseases-conditions/iron-deficiency-anemia/symptoms-causes/syc-20355034*.

Spain [31] and the *Netherlands* [32] are also developing gluten-free wheat that, if commercialized, will enable people with celiac disease to safely consume the grain.

Amfora, [33] a San Francisco-based biotechnology firm, is developing rice, wheat, legumes and several vegetables that have up to 60% more protein than existing varieties. Significantly, the amount of protein is increased at the expense of starch and other carbohydrates, thus increasing the nutritional density of foods made from these crops.

The examples go on and on: low-saturated fat *canola oil,* [34] *tomatoes* [35] with the nutritional benefits of chili peppers, allergen-free *peanuts* [36] and many more enhanced crops are being developed, but the takeaway is clear. While the organic food industry and its activist allies promote their products as healthier alternatives to conventionally grown food, it is genetic engineering that actually produces healthier and more nutritious products.

Calyxt's heart-healthy soybean oil is just the first of what is likely to be many foods developed with genetic engineering that will attract the interest of consumers. With more of these nutritionally enhanced, consumer-focused products headed to market in the coming years, the organic industry will find it increasingly difficult to deny the benefits of biotechnology and justify the inflated prices of its products.

Steven E. Cerier is a freelance international economist and a frequent contributor to the Genetic Literacy Project.

The GLP featured this article to reflect the diversity of news, opinion and analysis. The viewpoint is the author's own. The GLP's goal is to stimulate constructive discourse on challenging science issues.

ARTICLE 5

FARM CREDIT
TEXAS DISTRICT: Serving Alabama, Louisiana, Mississippi, New Mexico and Texas

https://www.findfarmcredit.com/landscapes-articles/beyond-his-fences/

LANDSCAPES, Winter 2017

Beyond His Fences

As one of the 2017 Faces of Farming and Ranching, West Texas farmer Jeremy Brown travels the country telling agriculture's story.

KATRINA HUFFSTUTLER

[31] *https://www.scientificamerican.com/article/scientists-genetically-engineer-a-form-of-gluten-free-wheat/.*

[32] *https://geneticliteracyproject.org/2019/02/11/rebellion-against-europes-innovation-killing-crop-gene-editing-regulations-grows-among-scientists-frustrated-member-states/.*

[33] *https://www.globenewswire.com/news-release/2018/06/28/1530955/0/en/Amfora-Unveils-Broad-Initiative-to-Develop-Crops-with-Enhanced-Protein-Content-for-Food-and-Feed.html.*

[34] *https://www.prnewswire.com/news-releases/cibus-licenses-ultra-high-oleic-canola-oil-trait-to-valley-oils-partners-300821616.html.*

[35] *https://qz.com/1518570/scientists-are-creating-super-healthy-gene-edited-spicy-tomatoes/.*

[36] *https://theness.com/neurologicablog/index.php/crispr-and-a-hypoallergenic-peanut/.*



Photo courtesy of U.S. Farmers & Ranchers Alliance.

Jeremy Brown thinks about the big picture when it comes to farming—one reason he named his South Plains farming operation Broadview Agriculture.

When Nordstrom, the high-end retailer, was in the news last spring for selling $425-per-pair "heavily distressed" jeans designed to look like they had mud caked on them, many in America laughed.

But cotton farmer and *AgTexas Farm Credit* (*https://www.agtexas.com/*) customer Jeremy Brown saw an opportunity to educate consumers: He took to Facebook, posting a photo of his own worn-out jeans, distressed from hard work growing the crop that jeans are made from.



Photo by Christine Forrest.

Brown, left, greets U.S. Rep. Mike Conaway, Chairman of the House Agriculture Committee, during the 2017 Farm Credit Young Leaders Program in Washington, D.C.

"Hey Nordstrom!" his post read. "I would be glad to sell you these jeans for $450. These jeans are actually worn by a real American cotton grower that you pay maybe $0.65 a pound for the lint. If you don't know, an average bale of cotton weighs 500 pounds. You can make 215 jeans out of one bale of cotton. Doesn't take a mathematician to see who is not getting a good deal. Support the American Farmer and buy more cotton!"

But that's just one example of this passionate grower's agricultural advocacy efforts.

Taking a Broad View

After earning a bachelor's degree in agricultural communications from Texas Tech University, Brown went to work for U.S. Congressman Randy Neugebauer. He enjoyed the work, but the farm was calling him back. He answered the call in 2009,

and has been growing cotton—both traditional and organic—peanuts, grain sorghum, corn and wheat ever since.

"I tried to do different things, but I realized I didn't want to do anything else but farm," Brown says.

His farm operates under the name Broadview Agriculture, which has a double meaning for Brown.

"Where we farm out here on the South Plains is pretty broad," he explains, referring to his flat, wide-open land between Lamesa and Brownfield. "Plus, we really try to take a broad view in the way we farm. From diversifying crop rotation to focusing on soil health, we just try to have a bigger view and a more long-term view."

Brown says that his family is always assessing new techniques and new technologies to make sure the farm is sustainable now and into the future.

Telling His Story

Part of that sustainability puzzle lies in consumer confidence. That's why he is dedicated to telling his story and the stories of other farmers as often as possible.

"There are a lot of theories out there about what farmers need to be doing and how they need to farm," Brown says. "But when it comes down to the practicality of it, those ideas don't always work. They might in a perfect world, where we didn't have to deal with weeds or pests or drought. But not in the real world."

Brown says he frequently is questioned about what he does on the farm—how he uses pesticides, for example—and he's always happy to respond.

"I think there's this idea that we're just spraying chemicals all the time. I try to explain we don't want to use those unless it's a need-basis situation," he says.

Facebook is his outlet of choice for consumer education, but he also has created YouTube videos showing how he promotes soil health.



Photo courtesy of U.S. Farmers & Ranchers Alliance.

Sarah and Jeremy Brown with children (top to bottom) Olivia, Isla Isabelle and Jude.

Faces of Farming and Ranching

Brown's "agvocacy" efforts haven't gone unnoticed. Last year, the Texas Farm Bureau asked if he would consider entering the Faces of Farming and Ranching com-

petition, a program of the U.S. Farmers & Ranchers Alliance (USFRA). If he was interested, the Farm Bureau would provide him with the tools to help him be selected. He was, and they did. Brown says *Farm Credit Bank of Texas* (*https://www.farmcreditbank.com/*) and Plains Cotton Growers also offered invaluable help as he competed against other farmers and ranchers for the chance to be an agriculture spokesman across the country.

In November 2016, he won a spot on the five-farmer panel, and since January, he's traveled the nation, sharing his story with consumers in places he would have never expected.

"Probably the weirdest experience was being part of the Food and Wine Festival on South Beach, Miami, Fla.," Brown says. "We were out there, in a totally different element, interacting with consumers and talking to them about where their food and fiber comes from."

A few weeks later, he was headed to Nebraska to participate in a panel discussion on GMOs—a topic on which he offers an interesting perspective, as a grower of both GMO and non-GMO crops.

"I'm not one to say everything needs to be organic or non-GMO," he says. "That's a niche market, and there's a group of consumers who want that. I don't think GMOs are evil. I'm looking forward to talking about pros and cons and how real farmers really use different practices."

While Brown's official term with the USFRA program will conclude at the end of 2017, he says he will always be available to the organization when he's needed.

"The Faces of Farming and Ranching program is a great resource for people to get fact-based information about agriculture," he says. "It's nonpolitical. It's just the facts. I've really enjoyed the opportunity to be a part of it."

> *"Sometimes as farmers we just go to the gin or the local place and talk shop. But we need to get out there and advocate for what we're doing as farmers. There are groups out there who are totally against us, and they're loud."*
>
> JEREMY BROWN.

Calming Consumers' Fears

His No. 1 takeaway from serving in this role is that consumers are scared.

"There's a fear that American farmers are doing everything they can to harm consumers, from planting GMOs to not caring for the land," Brown says. "It's the furthest from the truth. We're feeding and clothing our own families, too, and this is something we take a lot of pride in."

He says the importance of agvocacy is growing rapidly, and it's something all farmers should take part in.

"We have to go beyond our fences," Brown says. "Sometimes as farmers we just go to the gin or the local place and talk shop. But we need to get out there and advocate for what we're doing as farmers.

"There are groups out there who are totally against us, and they're loud. If we don't get out there with a unified voice and combat that, then we're really doing a harm to the industry," he warns.

SUPPLEMENTARY MATERIAL SUBMITTED BY JEFF HUCKABY, PRESIDENT, GRIMMWAY ENTERPRISES, INC./CAL-ORGANIC FARMS

Importance of the 3 year transition period

The organic law requires a 3 year transition period when converting land that has been treated with substances prohibited in organic production. The land must be free of prohibited substances for the 3 years and farmed using organic practices before you can obtain your organic certification in the third year of production.

The transition period can be financially challenging for many farmers and can also create a great deal of risk for growers. In addition to learning new farming practices, it takes time for the soil and land to become productive enough to achieve the same yields experienced in conventional farming. The harsh reality we learned at Grimmway/Cal-Organic is that an effective transition only takes place when nothing but cover crops are grown on that ground during that time. Therefore, the increased costs and labor associated with organic farming during the transition period occur at the same time that farmers are unable to grow the product necessary to receive organic market premium price.

We are very fortunate at Grimmway/Cal-Organic to have the financial, human and technical resources to invest and transition land to organic production, however most farmers do not have access to the resources that a company such as ours may have. Congress could invest in more technical assistance for farmers seeking to

transition to organic, as well as consider programs to help offset the financial cost during the transition process.

Clarification and expansion on the following question from Congressman Carbajal: Mr. Huckaby you mentioned a very important point in your testimony, that the future of organics will depend on the Federal Government keeping pace with the marketplace. Can you elaborate on that? What—what do you mean by that and share with us some examples that perhaps go to the heart of that issue?

Importance of Strong Regulatory Standards for Organic

Yes, as I stated in my written testimony, organic is a voluntary regulatory program. The USDA Organic Program provides clear and strict regulations and standards. Farmers opt-in to abide by these standards and, in turn, are rewarded with increased price premiums when they market their products under the USDA Organic Seal. It is critical that organic farmers are all playing by the same strong rules, as this is at the heart of why consumers trust the label.

The organic industry has seen massive growth since USDA put the original regulations into place in 2002. The growth in the industry has been positive for consumers and businesses alike, but with that growth comes the responsibility of USDA to ensure there are clear standards for certification of products that carry the organic seal.

When there are questions or clarifications needed to the organic standards, it may require government rulemaking or formal action by USDA. As you know, sometimes the Federal Government does not always move in a timely manner when issuing regulations. For a voluntary program like Organic, there has to be quick action on behalf of USDA to clarify or improve the standards, otherwise the marketplace becomes disrupted.

Mr. Pierson provided a great example of this during his testimony, as it related to the origin of livestock rules for transitioning dairy animals to organic. If there are loopholes or lack of clarity in the organic regulations, there will be a handful of actors looking to take advantage or cut corners. This not only hurts organic dairy farmers, but hurts the entire industry and companies like mine. Consumers need to be able to trust that everyone is complying with the same high standards.

As it relates to USDA keeping place with the marketplace, there groundbreaking innovation taking place in agriculture today with more and more farmers looking to be players in that market. However, if these innovating systems of production want to carry the organic label, there needs to be clear rules and regulations in place. USDA must be responsive when organic stakeholders request clarity and consistent application of the standards for all types of production systems.

Last, as the organic market grows so must the tools for organic farmers. Businesses exist that want to help meet the needs of organic farmers and processors, giving them alternatives where there previously weren't any available. We are seeing tremendous innovation in this area. Whether it is increased availability of organic seed or organic alternatives to substances, the USDA should support this continuous improvement in the organic industry by ensuring viable alternatives have a market in organic and strengthening the rules when the opportunity arises.

The Soil Health Benefits of Organic Systems

At Grimmway/Cal-Organic, we do business in both conventional and organic production and there are pros and cons in both. In organic systems, you must use preventative practices to control weeds such as conservation tillage, crop rotations to manage crop nutrients, and other mechanical methods such as mulch, hand-weeding, or mechanical cultivation. However, conservation tillage, when utilized thoughtfully and minimally, can be an effective weed control measure without sacrificing soil health.

In conventional no-till systems, weeds are oftentimes controlled by chemical herbicides aimed at increasing soil health. Benefits of no-till systems are reduced when taking into account the overall impact to soil health from herbicide treatment. Our experience at Grimmway/Cal-Organic is that the soils under our organic production are healthier and more productive overall than our soils under conventional production. When discussing the various practices used in agriculture to improve soil health, you must also focus on which practices are yielding the best outcomes.

○