Crops, Cattle and Carbon

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Greg Dalton: Welcome to Climate One at the Commonwealth Club. I'm Greg Dalton. Over the past five years, California's fight against greenhouse gases has largely focused on smoke stacks and tail pipes spewing carbon pollution into the air. In recent years, growing attention has focused on another source of emissions, food production. Scientists and authors such as Michael Pollan raised awareness about the climate impacts of petroleum-based system that delivers calories from the farm to our forks.

While agriculture is increasingly recognized as a source of greenhouse gases that are driving global weirding, they're also seen as an important part of building a more sustainable and resilient economy. New technologies, organics and other on-farm practices can potentially improve efficiency, improve human health and reduce environmental degradation. We'll discuss the food and climate nexus for the next hour with our live audience at the Commonwealth Club in San Francisco and four experts.

Cynthia Cory is Director of Environmental Affairs at the California Farm Bureau Federation. Paul Martin is Director of Environmental Services at the Western United Dairymen. Jeanne Merrill is Policy Director with the California Climate Action Network. And Karen Ross is Secretary of the California Department of Food and Agriculture. Please welcome them to Climate One.

(Applause)

Greg Dalton: Welcome

Karen Ross: Thank you.

Greg Dalton: Thank you all for coming today. Karen Ross, let's begin with you. California has a huge agricultural sector. It's about $36 billion, something around 81,000 farms and ranches. How does that connect with the state's efforts to reduce greenhouse gases? What's the connection between agriculture and climate?

Karen Ross: Yeah. That's a good question and there's a couple of ways of looking at this. One is that California agriculture is tremendously diverse as well as being tremendously productive. And you can look at the greenhouse gas emissions that have been attributed to California and the state which the State Air Resources Board says about 6% of the total greenhouse gas emissions are coming from the farm sector itself. But you also need to take a look at what the potential is for those of us on the farm to actually be sequestering carbon and with changes in some of our practices to be an offset to greenhouse gas emissions. But I also think it's really important that we remember that there's also tremendous peril that's presented to California agriculture with climate change. We are part of two interesting trends going on right now. One is really thinking about food security, what's happening around the world right now, where raising the prices of food to the highest they've ever been according the U.N. Food Index as well as food shortages have been feeding some of the revolutions that we're seeing.

So food security right now, where we have almost a billion people a day who don't have enough to eat, really has brought what the impact is to being able to feed those people to the forefront

concurrently through great efforts at the local level, Advision, food policy councils, Roots of Change, there's a renewed interest in where our food comes from, how it's produced and who's producing it. And so the emphasis on local and regional food systems is also making us aware of how do we adapt to climate change to make sure that we can feed the world and also have robust local and regional food systems.

Greg Dalton: And we'll get back to some of those. Some of those food prices are driven by extreme weather events and…

Karen Ross: Exactly.

Greg Dalton: …other things. Paul Martin, dairy, milk and cream, I believe the number commodity in the state, about a six, seven billion dollar piece of the agricultural economy in California. What's the connection between animal dairy and climate change?

Paul Martin: Dairy presents a particularly provocative opportunity to assist with climate change. The manure that our cows produce can be digested and the methane gas can be used to replace the consumption of fossil fuels. I think that is an opportunity that's not yet mature and it is one that we are going to work very hard to try to improve the opportunities for success for alternative energy production. Other things that we can do, we've got a lot of dairy barns located throughout the San Joaquin Valley that have acres of rough area. I'd like to see solar installations on those roofs. The other thing we can do, that we do very well in California, is we are probably the most efficient dairy industry in the world. And if you can look at the climate impacts based on the production of a gallon of milk, California leads everybody else. So the movement to the type of system that we have here in California and the improvement and continued evolution of that kind of system of producing milk is going to provide substantial climate change benefits.

Greg Dalton: Thank you. Cynthia Cory, do farmers – I mean, climate is something that's measured over decades and scientists like to have three decades of data to talk about climate. Most human beings and certainly farmers think about this season, this year, this crop. I mean, does a climate conversation even connect with farmers, your members, you represent many of the largest agriculture producers in the state. Is this – are we even using the right language to connect with your members?

Cynthia Cory: Well, I think that you said the right word in your introduction, climate weirding. I think we're kind of getting finally to the right word that they'll accept. The California Farm Bureau is a non-profit association of farmers and ranchers in California. So we represent small, big, all kinds. Family farmers is the main bulk of our membership and they have been farming for many generations. So they've seen all kinds of weather, and to them, it is climate change truly because climate changes. So there is a lot of skepticism in the agricultural community, and when I talk to them, I think what rings for them and what they think makes sense is energy efficiency. So I think it's always better if we can talk to them about how can we make your production system more energy efficient? And then forget that it has, you know, if we want to scientifically try to debate, whether it's tied to climate or not, I think it gets lost. So I don't spend a lot of time the minute AB 32 was signed. And I was talking to my members, which are the farmers and ranchers, I just said, "I'm not a climate change scientist and either are you, so we're not going to debate whether it exists or not. What we're going to talk about is that AB 32 exists and we're going to figure out ways to work within that system. And I think the best thing we can do is look at our production systems and figure out ways to be more energy efficient."

Greg Dalton: AB 32, of course, is California's Global Warming Solutions Act 2006. Fair to say that the agriculture industry - a lot of them oppose that law and then now it is the law. So Jeanne Merrill,

where are we now in terms of connecting sort of the agricultural industry with AB 32 which, initially, it was outside, and now some people want to connect those dots?

Jeanne Merrill: Well, climate change and agriculture I think is becoming increasingly connected through implementation of AB 32 both through the cap-and-trade program that's been proposed by the state that's now somewhat in question. But the state has proposed a cap-and-trade program that would then provide an opportunity for agriculture to reduce its own emissions voluntarily as being a part of the carbon market and the Air Resources Board is working with many stakeholders to – can sort out what that could look like. But there are other opportunities for agriculture, including the state. If it were to implement cap-and-trade, which again is in question, would generate revenue and one of the things that the California Climate and Agriculture Network that I'm a part of is working on to say that a portion of that revenue should go for the key things that we need to assist California agriculture to remain viable. When temperatures rise, water becomes more constrained, et cetera, and that's research technical systems for producers and financial incentives for on-farm conservation practices that can provide both the mitigation benefits, reducing greenhouse gas emissions or sequestering carbon, as Karen spoke about, or helping agriculture adapt to very different climate conditions in the decades to come.

Greg Dalton: Karen Ross, is that a good idea, to connect the agricultural sector to some of the revenues that might be generated by California's cap-and-trade system?

Karen Ross: I do. In fact, I'm enthusiastic about that and not just with regard to climate change, but when we look at the whole suite of ecosystem services that are provided by our farms, that there's public good that oftentimes comes from really sound management practices. So clean water can be a benefit from an adjustment of practices, helping with clean air, taking a look at biodiversity and wildlife habitat. So I think we're at a point in time where those have always been that's for the landowner to absorb the cost of doing that even though there's public good and we're getting much better at being able to account for nature's capital to be able to say, we, as a society are benefiting from this and, first and foremost, the open spaces provided by this. So if we want a certain set of practices to help enhance those kinds of public goods, then it's appropriate to share the cost of that. It's still going to be footed by the farmer themselves, but it's a cost-sharing mechanism that actually got a lot of grounding in the last farm bill and I think there's tremendous opportunities for us to continue in that path.

Greg Dalton: Cynthia Cory, do you agree that there's a lot of opportunities for your members for revenue as part of a cap-and-trade system in California for farmers to get a new source of revenue?

Cynthia Cory: I am very – when I talk with our members, when I talk to farmers and ranchers in the agriculture community, I say, "Don't think we're going to make any money. If we can break even, that's a good place to start. And then if we do eventually make some money, that would be great. But don't start out there." Because I think – I don't want to get expectations too high. The minute AB 32 passed in 2006, we started working on looking at production systems, agricultural production systems, and looking for those energy efficiencies, looking for those offsets, and I thought it was going to, you know, happen really quickly. And I was way overoptimistic. They're very, very complicated. It's very technically complex because you've got a biological system and you've got to measure it and it's going to vary and you're going to have climate change on top of it and it's not like you're producing the widget and sticking it in the factory and you know that that widget took that much energy to produce. You've got a living, breathing ecosystem and you're trying to quantify it. So it's a little bit more complex than, I guess, we had hoped. But if it's going to turn into an offset, that PG&E or BP or cement factory is going to use for an offset, it's got to be real. And a lot of other things, too. And so it's just taken a little bit longer. So I am – I always look at – I get up every morning and I look at the glass half full, but I do know that it's not going to be a quick easy, sexy

little fasting that's going to happen that we're going to be able to splash up there and it's going to be a slower, more technical complicated process.

Greg Dalton: Cynthia Cory is Director of Environmental Affairs with the California Farm Bureau Federation. Karen Ross, you want to add?

Karen Ross: Yeah. I just wanted to weigh in because I absolutely agree with Cynthia that we don't want to oversell this as, "Oh, way to get rich. We're going to go into the carbon market and buy and sell these carbon credits." But I think what is important is that we're recognizing the co-benefits that can come from sound management practices and that there's an opportunity to cost share that in return for providing public good and that's significant. It also, I think, helps us connect with different stakeholders, including our consumers, with the way we're farming and what that means for them. And I think it also helps us in the regulatory arena to be able to identify that this set of practices can, in fact, help us accomplish greenhouse gas reductions in addition to cleaner water or biodiversity, and that all of that has benefit. It's taking your assets and maximizing the use of that asset. We've tended to think of farmland is, "I produce this crop and that's it." And I think we can recognize co-benefits. Not that they're going to get rich off any one of those, but the whole package together can keep farmers viable. It can keep them on the land and it creates an exciting opportunity for the next generation to come in and that's what I see. Our youth are very excited about being environmental managers.

Greg Dalton: And let's hear from dairy, Paul Martin?

Paul Martin: Absolutely agree with what Cynthia said. It is not a panacea. We're not going to get rich on a methane digester right off the bat, but we are very early into the game and we need to try to figure out how we can use the resource that we have available. As far as the general ecosystem services, I can give you a really good example. Several dairies in the Sonoma and Marin County area have cooperated with a group called Students and Teachers Restarting Watershed and it had re-vegetated some of the creeks where the trees that were previously there have gotten old and senile and have not reproduced. So these schoolchildren came in and planted some more trees. Specifically on my place, I have a doe and two fawns every year that was not there before. I have a gray fox that has her babies in that creek. We went from five species of birds to 17 species in about three years. So these are the kinds of services that the California farms and ranches can provide. Think of what it would be like driving through Marin and Sonoma County and not seeing any cows. It would be a completely different scene than you see there now. So that's why when we talk about ecosystem services, we're talking about the whole spectrum of what farms and ranches provide, let alone the economic benefit.

Greg Dalton: Jeanne Merrill?

Jeanne Merrill: Well, there have been some studies that have suggested that when you do what Paul and others have done which is to plant riparian zones and farms that, in addition to having the wildlife benefits which are critical, but there's also a carbon benefit. The woody biomass in a riparian zone or in a hedgerow can account for 18% of the carbon that they're sequestering but only take up about 6% of the land. So that's significant. I think what climate change is going to mean for California agriculture is that, fortunately, we're quite diverse. We're probably going to have to get even more diverse and creative about crop rotations, about how we manage soil, about renewable energy production, finding other energy efficiencies, water conservation efforts, et cetera, and we really need the state engaged, working with producers to sort out what does a sustainable agriculture look like in California.

Greg Dalton: There was one study recently I saw from the Agricultural Research Service which

cited that outdoor production over confinement, which is allowing cows, I think, to range freely versus putting them in these concentrated areas, had 8% reduction in methane, nitrous oxide and CO2, and also that it transitioned from land rotated crops to perennial grassland also built up carbon in the soil. Paul Martin, is that the kind of thing that dairy farms might want to change their practice and have less concentration and go in that direction?

Paul Martin: Well, for every study that have shown that, there's probably another study that shows the opposite. And where we are right now in this discussion is we have dueling scientists out there and that will eventually shake itself out. It's going to take some time, but we all read peer-reviewed journal articles and try to make the best decisions we can. But that discussion is not over and my suggestion is to kind of sit back and let the scientific folks argue it out, ask challenging questions but remember one basic fact, when we think about the best way to produce food is that we need organic food because people want it. We need grass-fed because people want it. We need natural, because people want it and we need conventional because people want that kind of food. There's a place for every type of production. What we need to encourage is for each one of those types of production to do a better job with the way they produce, and that way, we'll make real gain. And so look at it from that standpoint.

Greg Dalton: Karen Ross, do you agree?

Karen Ross: Well, I do. I mean, the whole thing here is to really focus on continuous improvement regardless of how you choose to farm and what Paul said, I think, is a very important message. It's about consumer choice and it's about farmer choice. And we should not try to say, "One way of farming is the solution." We need to be able to farm for the consumer that we choose to farm for. So I know of young people who ere getting into farming. They only want to do a couple acres. They want to focus on selling to chefs directly within a 50-mile radius and that's fabulous, but there are some people who are very intrigued and feel a passionate responsibility to help feed the world and they want to have those global markets and they can do that, too. I think what's really important is that we embrace it all, that we have good stewardship practices amongst all of those farming systems, and that we allow them to co-exist and to continually improve their practices so that we all, as the public, can realize the benefits that are possible.

Greg Dalton: Karen Ross is Secretary of the California Department of Food and Agriculture. We're talking about cattle, crops and carbon at Climate One. Our other guests today are Jeanne Merrill, Policy Director from the California Climate Action Network, Paul Martin from the Western United Dairymen, and Cynthia Cory from the California Farm Bureau Federation. Organic crops are about 3% of red numbers of the farmland in California. Is that growing? Jeanne Merrill, do you think that if that grew, could that address some of the climate issues we're talking about, of more people, more consumers willing to pay their organic premium, and therefore, more farmers produce it.

Jeanne Merrill: Yeah. Well, it's interesting. I mean, obviously we're in deep recession. California has very high unemployment and yet, organic agriculture continues to grow nationally in 2010, organic food sales increased about 8%. In California, we're the number one organic-producing state in the country and have been for quite some time. We had the first organic certifying body in the country that started in the 70sm they're California Certified Organic Farmers, and they're part of our coalition. The U.N. Food and Agriculture Organization did a survey of research looking at the carbon footprints, organic agriculture compared to other systems and found that organic agriculture, because it is less dependent on fossil fuel inputs, has a lower carbon footprint. Its energy use is about 30 to 50% less than its conventional counterparts. And what we think is that there are lessons to be learned from organic agriculture. There're very creative and innovative organic producers in California of all sizes and shapes, producing vast diversity of crops and livestock products, and well, many of those practices can apply unconventional systems and are

being used in conventional systems as well. Cover cropping, composting, manure use for soil fertility, et cetera. So organic agriculture should be squarely in the middle of the conversations around climate change and agriculture, and shouldn't be sort of left on the side. It has something to say about what can happen in terms of climate change.

Greg Dalton: Paul Martin, a lot of your members have switched to organics and they're making money at it.

Paul Martin: Yes. We have a substantial numbers of producers that have converted over to organic, particularly in Marin and Sonoma counties. And from what I can ascertain, they are happy with the change that they made. However, that market has constricted in recent months, and so there are several of them that are having to deal with the increased cost of production for organic feed for cows, but they were only able to market about half of their milk. So this is – we hope we get out of the doldrums that our economy is in and can begin move forward again. But –

Greg Dalton: So are you saying people switched away from organic in the recession, that they got the premium like, "Oh, I'll go back to the regular stuff because that's –

Paul Martin: The consuming public has apparently switched away. The market has constrained to a certain degree and the folks that have converted to organic are continuing to feed their cows that way so that when the market recovers, they'll be able to move back, but organic is very definitely in the game. We have several members of our association that are organic and I've got one dairyman that milks 30 cows. Like I have another dairyman that milks 9000. So we cover – the dairy industry covers a huge spectrum and the way I look at it is the guy with 30 cows seems to be just as happy as a guy with 9000 cows.

Greg Dalton: Lesson there. Karen Ross, you want to jump in?

Karen Ross: No. I was just going to say that we have to recognize that one of the costs that can be a factor is the certification cost itself which can become a barrier especially when we've had the softening economy. I just saw the statistics between 2008 and 2009. We actually had a slight decline in certified organic acres and it could be because the market's not there, but you can bet that most of those people are maintaining the organic practices. They're just waiting for the market to come back to justify the cost of certification.

Greg Dalton: Cynthia Cory, let's get you in here. Your members, how many of them are organic? Do you see organic as a growing piece of production for your members?

Cynthia Cory: Oh, absolutely. I mean, as Jeanne said, we're the number one agriculture state, you know. It goes in hand that we're the number one agricultural producing – organic-producing state also. I don't actually know of our members, how many – what percent are organic, but we certainly do have a significant number of them that are and we, as a state entity that tries to help all the farmers statewide, support all the systems.

Greg Dalton: But you're agnostic. You don't promote organic because you have to be careful about your members, right? So you don't favor one over the other? You're agnostic on whether –

Cynthia Cory: Yes, absolutely correct.

Greg Dalton: Agnostic. Let's talk about Wal-Mart because Wal-Mart has actually been a driver here toward organics and toward certain practices. They banned the growth hormone in milk and that had a tremendous impact on the dairy industry. Paul Martin, what extent of large driver like Wal-Mart shaping and creating markets for organic dairymen and other producers?

Paul Martin: Well, there's a very long story about the controversy regarding bovine somatotropin and its use in dairy cattle. And it – we have to, as producers of food, listen to our customer base. And our customer base said, "We're a little skeptical of this. We'd prefer you didn't use it." So practically, everyone has stopped using that particular material. Wal-Mart was not the driver for that particular instance, but they are the driver in this whole sustainability movement that is taking place. And the way I look at it is, in sustainability, I use the three-legged milking stool which kind of comes natural to me as my analogy for sustainability, but it involves ethical production, it involves scientific and environmental responsibility, and it involves the economic performance because, with any one of things, you are not going to be sustainable. And so what Wal-Mart is doing is trying to roll all this together into a system of production and it's a system of production that I think most of our folks will address. Nobody gets up in the morning and says, "Okay, I'm going to go out and mess up today because that's just what I want to do." But they do get up every day and say, "I hope I can make some money." So if we're going to have sustainability, we have to address all three legs of that milking stool. And then, in the conversation on those three legs, don't forget the seat, the platform that those legs support and that may be entirely different in San Francisco or in the Midwest or in a third world country someplace else in the world. So you have to consider where you are and what the cultural base of how you're going to define sustainability. And it's not the same every place in the world.

Greg Dalton: If Wal-Mart is successful and they're very clear – we've had whole conversations here based on Wal-Mart sustainability initiatives – that they want to drive away that price premium between organics and conventional. They want to make organics accessible and affordable to all their consumers and not have it be a niche, sort of coastal elite product. If they are successful in that and a lot of people bet on Wal-Mart being successful, how's that going to impact California agriculture? If they sort of make organic mainstream because they think it's – Jeanne Merrill?

Jeanne Merrill: Well, I think Paul hits on a very important point. That sustainability includes economic viability and the concern about having such a large entity in the market, like Wal-Mart, dictating prices for farmers is that you erode that economic viability. We need a diversity of farmers, small, medium and large, and they need a diversity of markets. So they're not dependent on the Wal-Mart to the world who then squeeze them on price which, unfortunately, that's what Wal-Mart is known for, not just in food but in all areas of their business models. So, we have a lot of concerns about what that means. It is not enough to be environmentally sound. You have to have the economic viability as well as the social responsibility.

Karen Ross: Could I add that in this organic discussion, what's really overwhelming over the last three years is the commitment to local and regional, and that creates really wonderful opportunities for us as well. So I don't we can divorce just one system of farming, but to think about the emphasis on local has also grown and has become a very important value for our consumers and for retailers.

Greg Dalton: And California agriculture is an export-oriented economy. It's very global. Is there a conflict between us exporting ovens all over the world? I visit Hong Kong frequently, I love to get my little Watsonville blueberries or raspberries there, but then I think about, "boy, the cost of transporting those across the ocean an refrigeration." Is there a conflict, Karen Ross, between localism and globalism?

Karen Ross: Well, sure you could say that if you really only wanted to focus on eating 50 miles from home, but I know some of my friends who went to graduate school at Cornell and got really tired of potatoes and vegetables in the middle of the winter.

Greg Dalton: Sure, yeah.

Karen Ross: So it's about consumer choice, it's about making your own personal value judgment of how you want to farm. And remember, going back to my opening comments, we have a world population that will be almost 10 billion people within 35 years and so we need a lot of investment to be able to feed people around the world and what's really exciting for me, having been with the Obama administration, is the Feed the Future initiative which is about the urgency of feeding those people today but also making the investment in those countries to help them sustainably farm for themselves. And so I think there are tremendous opportunities for all of this and to be able to meet the consumer choice for the value system that they have. And that, to me, is a tremendous opportunity. Plus when I look at how much food California grows and what we can do on a nutrition side to improve the health of our own citizens here in the state, we now have a Health in All Policies initiative for the state of California that starts with making sure that every Californian, in their neighborhood, in their school and in their workplace has access to healthy, California-grown food.

Greg Dalton: Karen Ross is Secretary of the California Department of Food and Agriculture and formerly Chief of Staff for U.S. Secretary of Agriculture, Tom Vilsack. Our other guests today at Climate One are Cynthia Cory with the California Farm Bureau Federation, Paul Martin with the Western United Dairymen, Jeanne Merrill with the California Climate Action Network. I'm Greg Dalton. You mentioned organics and, Jeanne Merrill, one of the raps against organics is that they can't feed the world. They can't scale. It's a niche product. It's great for us in San Francisco and certain areas, but it's not going to feed the world of 10 billion people that Karen Ross just talked about. Is that fair?

Jeanne Merrill: No. There have been just a number of surveys of organic yields and, in fact, organic agriculture can produce equal effect, greater yields in some situations as conventional agriculture and that's because it's built upon the notion of healthy, fertile soil. Soil is the basis of our agriculture and organic agriculture has consistently been focused on building that healthy soil and we've seen time and again in California, in other parts of the world that organic agriculture can perform quite well when it comes to yield.

Greg Dalton: Cynthia Cory, can organics feed the world? Are they more efficient than nonconventional?

Cynthia Cory: I'm not an agricultural economist. I am skeptical, let's put it that way, at this point and I agree with Jeanne. I mean, healthy soil, which I do know a lot about it which my background is, is an agronomist – is key, but it's not the only component. And I think we've got a long ways to go before we would have a healthy soil base worldwide that could feed the world without any kind of form of – well, and one thing I also have to remember, that is organic, they absolutely do use sulfur. They use what we call pesticides, whether – and so, I mean, I think people's idea of what organic is, might be –

Greg Dalton: Romanticized?

Cynthia Cory: Yeah.

Greg Dalton: Yeah. Paul Martin, can organics scale – can organics really help pour milk over all the Wheaties that people eat in America?

Paul Martin: I would have to be on the other side of that point from where Jeanne is. I don't think it can scale up in the dairy industry to that point because as soon as it scales up, then it gets questioned as to whether it's truly organic or not. We've seen that already with some of the operations that have existed that we're trying to fill the organic market, but they were doing it from a very intensively operated standpoint. But one thing I would mention again when we're looking on a

global basis, I was at a conference where people from all over the world in the dairy industry were in attendance, and in the middle of the conference, one lady stood up that was an extension worker in an African country and she said, "You know, you guys from California, you get dairies with 5,000 cows." She said, "That's pretty cool. You guys from Russia, you got dairies with 3,500 cows. That's pretty cool. You guys in the Netherlands, you know, you got some big dairies that produce a lot of milk." She says, "But I've got tribesmen and my tribesman that is milking one cow and providing milk to a neighboring family considers himself a dairyman just as much as you folks do." This was kind of a surprise to me. But then she went on to say, "And when you talk about performance, if he gets a little bit better cow and can produce milk for two families, he just cut his carbon footprint by 30%. Can you guys do that?" So that's the kind of organic agriculture that I see a need to support elsewhere in the world because they're not using the technology that we use here, but there still is a lot of improvement to be made. So from that standpoint, I tend to agree with Jeanne, that organic production can go a long ways to improving the quality of life throughout the world.

Greg Dalton: But you also think that the future is a more concentrated factory farms. Maybe you don't like that term, but do you think that the future is more concentrated operations rather than what you call pastoral free range kind of animal agriculture?

Paul Martin: Yes, I do. And that kind of operation allows us to be more efficient than our transportation. It allows us to be more efficient in our energy use. It allows us to be more efficient in the utilization of by-product feeds which would be a cost to society if we did not run them through cows first. So I think intensification is going to be very important to be able to feed the world. The thing that bothers me is that not very many people are worried about feeding the world and I think that that's an issue that some of our younger folks need to address because hungry people create revolutions and they cut down a lot of trees. And if we don't deal with that, we're going to be in a world of hurt.

Greg Dalton: Paul Martin is Director of Environmental Services with the Western United Dairymen. Karen Ross, you want to respond?

Karen Ross: I just wanted to really underscore that. When we look at the Arab spring and, of course, people are unemployed, but they also – they were experiencing food shortages and rapidly rising food cost. It's very easy for us to take for granted the food choice as well as the availability and affordability of what we have because we spend less than 10 to 12% of our disposable income on that, but there are populations in countries around the world that spend as high as 40, 50, and 60% of their disposable income. So their quality of life comes from having those opportunities. Just since last June, the World Bank estimates that over 44 million people have been pushed into poverty because of a rapidly rising food cost. So it's something that we, as citizens of the globe, really need to be mindful of.

Greg Dalton: And a climate scientist would clearly say that extreme weather events, whether it's…

Karen Ross: Exactly right.

Greg Dalton: …droughts in Australia or in the United States or in declining water flows from the Himalayan pleateau is going to further put upward price pressure on rice and…

Karen Ross: Absolutely.

Greg Dalton: …it wasn't too long ago we saw rationing of rice here at Costco in San Francisco. But one of the reasons food is so cheap in America is we heavily subsidize corn and other commodities. There's quite a debate now about subsidizing corn ethanol. The Coke brothers, who are

industrialists, came out in favor of it. Tim Pawlenty says he went to Iowa and talked about ending corn subsidies. How is this going to affect California agriculture which relies on cheap corn feed to feed its animals? Paul Martin?

Paul Martin: Well, corn is not cheap right now. Corn is extremely expensive right now and my answer is very short. It doesn't make sense to me to use 40% of the nation's corn crop to produce ethanol and that policy has to be changed.

Greg Dalton: So there's a numerical mandate of the Department of Energy put in place. We have produced so many gallons of corn ethanol. Are you saying that should change? Karen Ross, you're –

Karen Ross: And I guess I would argue that corn ethanol is a transition to the next better renewable fuels, standard. And biofuels and biodiesel, in particular, have huge potential to help us not just on our economic well-being of being dependent on imported oil and trying to reduce that, but also our environmental well-being of what we can do with greenhouse gas reduction by being able to use plant-based and waste-based. And that's why I'm very excited for people not to abandon the technology of ethanol production, but to think about how do we take all the waste that's generated by us as human beings, by what comes out of cows and orchard trimmings, and food processing, and being able to convert waste into biofuels. And I think the promise of that for all of us and for the world has not begun to be tapped.

Greg Dalton: So you're in favor we should use corn not for fuel but for animals that would put ease on the price pressure. This is clearly not running in the Iowa primaries anytime soon.

Karen Ross: But I also would point out that there is a very likely discussion about what's going on with our farm and food policy in this country and, in fact, farm groups themselves are saying it's time to re-examine historic policies and really be more about risk management tools that make sense for a variety of crops.

Greg Dalton: Cynthia Cory, do California farmers care whether the corn goes into gas tanks or into the bellies of cows?

Cynthia Cory: It depends which of the 400 commodity you talk to.

Greg Dalton: Okay. Yeah.

Cynthia Cory: You know, we are very, very diverse more than any other state in the nation. I am actually from Iowa, originally from a long line of corn growers, and I remember my uncle always saying they didn't need subsidies, but it didn't happen overnight. We didn't always have subsidized crops. And so it's not going to – we're not going to change it back over overnight either. It wouldn't be fair because we have created this system over time and we need to figure it out just like organics, and organics is a wonderful goal to feed the world. It's just that it's not going to happen overnight and it's going to take a long time, if we ever get there. It's a complex – our good system is very, very complex, and it's not fair to try to find simple, easy, fast answers. But you have to understand that the – I mean, one thing is we are very feed-deficient in California and we don't have a lot of farm crop – we don't have a lot of program crops that are subsidized. There's a lot more specialty crops and the money that's coming to the specialty crops in California is for research. It's not for production. I think as we look at how we can look at ecosystem services versus just straight production payments, farmers are open to that. It's just that you just can't switch it overnight and say, "Hey, we're going to change something that we've been doing for the past 75 years."

Greg Dalton: Cynthia Cory is Director of Environmental Affairs of the California Farm Bureau

Federation. We're discussing crops, cattle and carbon at Climate One at the Commonwealth Club. I'm Greg Dalton. I'm going to ask one more question. We're going to put the microphone right where our photographer, Ed, is sitting right now and I advise you to come up and form a line over here, Jane Ann or Adam will help you get in line to ask a question of our experts today. Food policy in America is usually the jurisdiction of the federal or the state government, and yet recently, we've seen cities get in on action on food. So, Karen Ross, tell us what's Sacramento and, I believe, it started here in San Francisco, what cities are doing with food policies which is a very new thing.

Karen Ross: Oh, I love it. It's a real intersection of agriculture food, health, and nutrition. I think as all of us re-educate ourselves about sound nutrition and what it can do to prevent chronic diseases and the cost of healthcare, we'll see even more emphasis on that and I give a lot of credit to our first lady, Michelle Obama, who really made this a central point of discussion in Washington the last few years concurrent with the reauthorization of the Childhood Nutrition Act, and that's what cities are doing. They're saying, "We can do something about this." So it's about identifying open plots for community gardens. It's about making sure access to healthy, nutritious locally grown food is available. It's about understanding what does it take to help those farmers on the urban edge or right in our local communities. What does it take for them as far as water or transportation? How do we aggregate to make sure it's getting out? And how do we assure access to our poorest neighborhood? The work that's being done to address the food desert problem is huge. And what I love best about it is that as we create food policy, it goes back to what food needs to be. It's about sharing and building community, and that's what I'm seeing. Just last week, I was in San Diego. They just received a newsletter recommendation. Oakland has done that. L.A. has a very robust food policy initiative. Sacramento has urban rule that connects with the awesome planning tool that's captured a lot of attention for regional planning. And I think Fresno is about to undertake that. So I see wonderful opportunities to connect the dots to share best practices and to take this. I mean, I think this is something California can and should own, healthy people, healthy crops, healthy communities.

Greg Dalton: Hey, we're in a state of foodies, so let's have –

Karen Ross: Well, we have such great food here.

Greg Dalton: Yeah, we're very, very spoiled. Let's have the first audience question, please.

Audience: Hi. Actually, I need to just provide a little bit of quick information, and then if anyone wants to speak to me afterwards, that would be great, but ZERE Corporation has developed an air independent internal oxidation plant which will utilize waste biomass like corn stover and rice stalks as fuel and produce liquid biofuels, bio-based products, electric power heat, and liquid CO2 with near-zero emissions, so –

Greg Dalton: We have a question about waste energy?

Audience: Well, I just wanted to say that Dr. Reginald Mitchell at Stanford University has done the bench testing, and so if you were in the situation of needing to get rid of rice stalks or corn stover or hotel waste mass or anything like that, they can contact ZERE Corporation.

Greg Dalton: Thank you. So let's talk about waste energy. We didn't get to that. Paul Martin.

Paul Martin: Let me issue a cautionary note as far as waste energy goes. In order to maintain proper soil health, you need to have a certain amount of organic matter, and if we remove all the plant material that we grow, particularly in soils like we find in the Sacramento-San Joaquin River Delta…

Karen Ross: Yeah.

Paul Martin: …we are hurting the development of those soils. And we've seen in the Sacramento-San Joaquin River Delta that, with continued farming and removal of the crop residue, the soil is actually contracting. So residue management has to be considered when we're talking about waste energy because we can't take all the organic material out of the soil.

Greg Dalton: Well, we can do that afterwards. Next question, please.

Audience: Yeah. You said something about that methane – that all this cattle emit can be used for benefit. What I've learned so far is that it's even much worse than carbon dioxide, and also could you talk a bit about, you know, with the commercial growing of cattle, most people don't realize the very unhygienic way they're brought up and the abuse and it's unhealthy for us, and even if there's no growth hormone, there's steroids and antibiotics, and those things going to our bodies, and –

Greg Dalton: Thank you. And what –

Audience: …and why is it so expensive to be certified organic? That would be great if it wouldn't be.

Greg Dalton: Okay. So methane, Paul.

Paul Martin: Okay. I'll answer the methane portion of the question. Methane comes from both ends of the cow. Enteric is what she breathes out in the manure production. One is in an anaerobic situation, but the methanogenic bacteria make nothing. So it comes from both ends of the cow in about equal amounts. These things you can do on the front end of the cow to manipulate the ration that she's fed, and that's something that we work pretty hard on because any methane that she breathes out is lost energy that she's not able to use for production. Okay. From the standpoint of the methane itself, it has a global warming potential 21 times CO2. Nitrogen oxide has…

Karen Ross: (00:47:13), 300.

Paul Martin: …300. So every gas does not have the same global warming potential. So I'll stop on that one.

Greg Dalton: That the methane is extremely potent. Quickly, how – why is this so expensive to be certified organic, Karen Ross?

Karen Ross: It's just that they're partly audit system and there's a cost associated with that, and so if you're not getting the market return, why would you certify, although you won't stop doing the farming practices. It's just something that comes to us continually.

Jeanne Merrill: The USDA has a program to help provide cost-share dollars for organic certification, so –

Greg Dalton: Okay. Next question, please.

Audience: Yeah, hi. Cap-and-trade didn't – wasn't successful, but as climate change unfolds before us, the country may implement significant price on carbon in the future. How will that impact agriculture, dairy, et cetera, both pro and con? Maybe it was like a significant price on carbon.

Greg Dalton: Cynthia Cory?

Cynthia Cory: Well, I don't know if we've proved out that cap-and-trade isn't successful yet because

we haven't implemented it yet.

Paul Martin: It failed nationally –

Greg Dalton: At the national level, it didn't go anywhere.

Cynthia Cory: Oh, okay. I'm sorry, I didn't hear that part. But how do you create a regional market? Because, as you know, we're about to – even though there's been a hiccup in the process here at the state level, it's well on track to continue probably soon after the beginning of 2012.

Greg Dalton: So there's – for people listening, there's litigation that has suspended California's cap-and-trade law, although the rest of AB 32 is going forward. But can California go it alone? I think as part of the question is, United States is not going to implement a national system. Karen Ross, can California do it with the other states? And some of these other states have been wavering and wobbling like that.

Karen Ross: Well, they have been, although there's been a lot of time and effort invested in building coalition states as the previous administration referred to it, as some national governments can, in fact, make a lot of change happen, that oftentimes, if we focus on more regional scale, we can test something and start to make it happen, and drive change further up. I think it's obvious from California's history and the regulatory arena. We do believe we can go it alone and we have been successful oftentimes because of trying to address issues of concern at the state level at getting the waiver or their accommodation from the federal government to be able to proceed with some of the programs that we've had. So I think, at this point, Governor Brown is committed to climate change and implementing the AB 32 requirements. There's no reason to think that it's going to change and that it's incumbent upon us to continue to reach out to other states and other countries who are proceeding down this path to try to make those kinds of global and regional partnerships that will drive change at the national level.

Greg Dalton: And, Paul Martin, the Dairymen still support cap-and-trade, yeah?

Paul Martin: Actually, my organization has not taken a position. The things that we deal with on the climate front, exceedingly hot weather, particular periods of time of high humidity, our guys are pretty well dealing with those on an individual basis. They have not made the connection to an overall, "Oh, this is because of climate change." So they're dealing with them in such manners as redesigning their barns for more efficient cooling, that kind of thing, pretty much on individual basis, but they haven't really coupled it all together and said, "Yeah, this is climate change."

Greg Dalton: Okay. Next audience question, please.

Audience: Thanks I just want to thank you all for being here today. This is a great discussion. So I'm going to use your three-legged stool as my platform. And, you know, a stool is best if it's flat, but I think we have an imbalanced stool. If you look at the three forms of capitalism, you have natural capital which is fixed at 1, can't grow or decline according to laws of thermodynamics. Second is human capital, which is currently growing about 1.5% which is giving us 10 million or 9 billion people by 2050. And the third leg of the stool is the financial capital and that's where the imbalance is because it requires 8% growth, 10% growth, 25x, 50x, you know, I want a group on stock or whatever like that. So the question is, given the fact that – I just read an article the other day, 35% of the food that we purchase, we throw away – part of it is that there's a constant desire for growth. We got to grow, we got to grow, we got to grow. How do we get that stool balanced so that the capital for human, natural and financial are balanced?

Greg Dalton: Thank you for that question. Who'd like to answer that one? Paul, it's your stool, I guess you're –

Paul Martin: You guys think while I – I'll get the first answer. I kind of – who was it, Satchel Paige, the baseball pitcher that said, "Don't look behind you because somebody might be catching up," and that's kind of the economic system that we're involved in right now. It very definitely is based on growth and I don't think anybody has really designed a way to have an absolutely stable and closed system that we do depend on growth. We depend on growth. I mean, look at the government. We depend on growth in order to finance the government. I remember a city councilman in my town of Petaluma lamenting that she may land use decision based on the increase in tax revenue. So she's depending on growth in order to keep it going. So that very definitely is a system we're involved in.

Greg Dalton: Karen Ross?

Karen Ross: Yeah, I just want to suggest that perhaps that has been the way of the past and that there's some indicators that I think – I don't know the answer, but there are indicators like the long-term unemployment that was suffered in this country. We've had rapid growth in China and India which is creating huge middle-class sectors, but is it really sustainable? I think that's some of the questions that are being asked, and if we have long-term unemployment and people get conditioned to less this or less that and start to have more human connections and start to be part of their community, do they start to find a replacement for the kind of rapid growth by things consumption model that is very much what the past few decades was about. I don't have the answers, but I think there's some interesting trends going on here and around the world that suggest maybe our future is going to look like more the past past before we got into everything being built on a rapid consumption of everything mode.

Greg Dalton: These young people often look at mobility as a service rather than coveting a car to own is one example of something that they – some generational changes that are happening, and consumption and expectation patterns. We're discussing cattle, crops, and carbon at Climate One. Let's have the next question, please.

Audience: Let's see. I've heard reference to the agricultural producers, they won't relate to climate change but energy efficiency, and the consumers want organics. And we're taking advantage of these sort of personalized interests to drive – to solve a global problem which is climate change. Is it enough and can we really count on people acting in their-self interest to solve a global problem?

Karen Ross: That's good. I think there are a couple of things that haven't been brought up today in the depth that they really deserve it because I think they're creating more of a sense of urgency. One is what's happening with invasive species and weeds that are going into areas they weren't before. If you look at our forests of the Rocky Mountains, for example, a change in temperature, 3 degrees has now brought pine bark beetle that's creating unbelievable devastation to the Rocky Mountains. It's now 150 miles further south than it once was, and those start to create where we all share the pain of what that is going on, and I would suggest California with our water situation, and the events that you talked about as we learn how connected we are in the globe because buyers on this continent and exchange route on this continent and floods in this continent altogether contribute to a food shortage and rising food prices that perhaps it will be unfortunate kinds of situations like that. Plus, combined with the next generation, I really admire the youth of today because they're so connected on a global basis that they have a sense that they are citizens of the world, and I think that's good for our future. I'm an optimist.

Greg Dalton: Karen Ross is Secretary of the California Department of Food and Agriculture. We're discussing agriculture and climate change at Climate One. I'm Greg Dalton. Next audience question,

please.

Audience: This question is for Jeanne. What's your plan B if cap-and-trade does not work?

Jeanne Merrill: We're not particularly tied to cap-and-trade as part of the solution for AB 32 and the Air Resources Board yesterday came out with their review of alternatives to cap-and-trade. So that includes carbon taxes, truck regulation, et cetera. What we're most concerned with is that as we've been talking about today, California agriculture is uniquely vulnerable when it comes to climate change and we don't have the resources to address that. For example, farmers need good technical assistance that's based on science to understand what the alternatives may be for them to better conserve water or consider other crop rotations, et cetera, but the number of farm advisors that we have in California, the peak of them, was in 1969. So California has done a lot on environmental policy and invasion, but really has not played a leading role in figuring out innovative agricultural policies to be able to address climate change. So what we would like to see, whether it comes to revenue through cap-and-trade or another source, say investment in research and technical systems and financial incentives so that California agriculture is well positioned to deal with a very different climate 50 to 100 years from now.

Greg Dalton: We have a few minutes left. Let's try to get in as many questions as we can here at Climate One. Please.

Audience: Yes. I think the two buzz words I'll use are contamination and contagion of contamination and atrocity. I don't like buying food from abroad – I won't name the country, but I know their soil is full of toxic substances. I don't like the fact that there are not openness about conditions of the soil that food imports coming here and what that means for the consumer. At the same time, I don't like exporting the atrocity on animal – anything based on animal cruelty or any kind of cruelty. So my question is, before we start expanding the global interchange game, is there no possibility of cleaning up acts locally, meaning here domestically, and in other countries, and addressing the terrible devastation that agricultural and economic policies have placed upon us? So before we go forward, is there no time to clean up? Thank you. I'd like to know.

Greg Dalton: Cynthia Cory?

Cynthia Cory: I spend all of my time working with agricultural community on environmental compliance and I can assure you that, in California, we are the healthiest, most proactive environmental regulatory system of agricultural food in the world, and I've also had the opportunity to work around the world in agricultural systems. So while we will always need to get better, and there's plenty of opportunity to get better, I just want to assure you that there is a very, very high degree of environmental integrity in our food production system in California.

Greg Dalton: Paul Martin, I mean, factory farms, CAFOs, people see the concentration of feed loss, et cetera, I think that often – that image comes to people's mind when questions like that come up.

Paul Martin: There's no question that it does come to people's minds. I would suggest that a greater familiarity with what actually takes place on a CAFO which – CAFO is acronym for concentrated animal feeding operation and the definition includes the fact that there's no natural growth of vegetation in the area where the animals are housed and that could be a dry lot or it could be a free stall barn like many of our dairies use, but when you – I'm going to be a little facetious here, but when you look at it and apply that definition, most of us live in CAFOs because the city of San Francisco is a CAFO. We don't grow our own food within our boundaries. So it's not a question of whether it's good or bad, it's a question of whether you, on your operation, are doing it well or not. So you can have a very well-operated pastoral system and you can have a poorly operated

pastoral system. Same thing on a CAFO, you can have a very well-operated CAFO or you can have one that has problems and should be fixed.

Greg Dalton: We're getting close to the end here. Next question, please.

Audience: Yeah, thank you. I just want to – we talked a little bit about what happened with the climate legislation federally and we've talked a little bit about the possibilities of – the log jam here around AB 32 and implementation. I'm interested in how any of you might consider or if you think it's possible that California could develop its own comprehensive agriculture and food policy that would be an analog to a federal bill that would free us up to be creative. I know there's some budget constraints right now, but thinking long term, is that a possibility?

Greg Dalton: Secretary Ross?

Karen Ross: Well, I would say yes and it's because of what's happening at the local level that suggests that we don't have a California food policy. We do now have because of the strategic growth initiative under SB 375 a couple of years ago. We now have one health or Health in All Policies type of approach and part of that is built on food. I would suggest there is a need for us to take what's happening at the local level and present a California state food policy and we could create some momentum for the things that we need, especially when I think about some of the biggest needs for how we continually improve and adapt to the changes that we're facing, and research extension, financial incentives and food access. I think those are all things that go together really, really well, and at the same time, if we feed ourselves good nutritious food, we can also avoid healthcare cost down the road. So I think there's every reason for us to consider that.

Greg Dalton: Jeanne Merrill?

Jeanne Merrill: Yeah, I absolutely agree. We did – we were curious. We want to get a sense of what are the resources currently available for California farmers and ranchers when thinking about climate change, so we looked at the research that's being conducted, what's the ability of a farmer to access technical assistance, and then what are the state's programs to support on-farm conservation through financial incentive. And we found that there are plenty of other states, Wisconsin, Iowa, Pennsylvania, Michigan, et cetera, that provide programs, cash or dollars incentives, for farmers and ranchers who are interested in doing on-farm conservation. We don't have anything like that in California as the leading agricultural state. We're just behind the curve, so I think, absolutely, there's a lot of room for plenty of innovation for state food policy in California.

Greg Dalton: Let's squeeze in one last one. Yes?

Audience: We talked about the difficulties of China just going to take a long time, how farmers can be informed about their choices, et cetera, and we've talked about the role of advisors and so forth in the government, but what is happening in the farming community or perhaps between different groups to get farmers better informed to collaborate perhaps about solutions across different farms and so forth, and perhaps not taking so much particular approach but just practical things that they can share, too, like (01:03:50)

Karen Ross: I'd like to give an example from my previous career with the wine and wine grape community where we created a state-wide sustainable wine growing program which is really about sharing practices across your peers, you have early adaptors. There are now 14 different commodities that are creating similar programs. (01:04:07) will be out shortly and so there are those kinds of actions that are happening already. The other thing is that anything that shortens the distance between the farmers and consumers, so consumers can express, "This is what I would like,"

and a farmer goes, "This is where the market is," also creates pathways to kind of change because they recognize that there is a demand for it and why the demand is there and I think those are good efforts as well.

Greg Dalton: And we need to end it there. Our thanks to Karen Ross, Secretary of the California Department of Food and Agriculture; Paul Martin, Director of Environmental Services with the Western United Dairymen; Cynthia Cory, Director of Environmental Affairs of the California Farm Bureau Federation; and Jeanne Merrill, Policy Director of the California Climate Action Network. We've been discussing crops, cattle and carbon at Climate One. I'm Greg Dalton, thank you for coming and thank you for listening.