

The Valley Farm Forum
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Genetically Modified Organisms: The Implications for Agriculture

Avery - Benbrook Transcripts

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Host Jeff Ishee:

Good morning. We'd like to welcome you to the Valley Farm Forum, a monthly program where we discuss the agricultural issues of the day, with your participation. If you'd like to join the conversation this morning, give us a call at 1-800- 388 - xxxx.

Today we have a superb topic for discussion - Genetically Modified Organisms: The Implications for Agriculture. Joining us in the studio today is Mr. Alex Avery. He is the Director of Research and Education at the Center for Global Food Issues in Churchville, Virginia. The Center for Global Food Issues conducts research and analysis of agriculture and the environmental concerns surrounding food and fiber production. Joining us by telephone this morning from his office in Sandpoint, Idaho is Dr. Charles Benbrook, who runs Benbrook Consulting Services. Dr. Benbrook is considered by many to be an expert in the field of biotechnology and agriculture.

Dr. Benbrook, let's start with you. I thought a good way to lead into this topic would be to look at some of the headlines we have seen in recent days concerning genetically modified organisms (or GMOs). In January, Frito Lay told farmers not to plant GMO corn. On February 17, one headline read "Group says biotech industry is staggering under public resistance." On February 18, another headline read "EPA advisory panel is seeking more testing of GMOs." What's going on here? What's the story all about?

Charles Benbrook: I think it's about a technology that's been pushed into the marketplace a bit faster than has previously been the case, and probably a bit faster than the science is ready to support. What's going on in the United States now is sort of a regrouping in the review, approval and uses of a wide class of technologies that rely on genetic engineering in food and agriculture production.

Host Jeff Ishee: My knowledge on this topic is fairly limited, and I believe that most of our listeners also have limited knowledge on the genetic manipulation of agricultural products. We all are here to learn today. I'd like to ask our guest in the studio today, Mr. Alex Avery, first of all, let's define for our listeners "What is a genetically modified organism?"

Alex Avery: Well, Jeff, a GMO refers to plants and animals that have been altered using the modern techniques of biotechnology. These are the techniques that were pioneered during the 70s and early 80s to identify genes in various organisms, determine what the genes function is, how they interact in the body, and really the manipulation of those genes - the cutting out of one organism and insertion into another organism, or the deleting from an organism, or canceling out so that gene is not

expressed in an organism. All of this is done at the molecular level, where we are turning specific genes on and off, or inserting. That means that you can use either a gene from the same plant, put in more copies, delete it, or you can take genes from other organisms and, for instance, take an animal gene and put it in a plant. It evokes, well, the term used in Europe is “Frankenfood.” It evokes a kind of scary image of us stepping into God’s role.

The fact is that we’ve been manipulating the genetics of our crops and livestock species for eons. Beginning with specific selection, the culling out of our herds the animals that didn’t do well and right on up to the present. That’s the term “genetic manipulation” today - specifically the biotech manipulation.

Host Jeff Ishee: Do you agree with that Dr. Benbrook?

Charles Benbrook: Yes. In large part, Alex has described some of the applications of genetic engineering techniques accurately. I think one particularly important point that your listeners need to be aware of is that you can think of genetic engineering in food and agriculture as “The Force” in the Star Wars Trilogy. It is a broad array of scientific techniques that make it possible to do a lot of unique things with genes and genetic material. These techniques are, in and of themselves, neutral. They are part of our advancing science and technology and understanding of biology. The reason that biotechnology has become so controversial is some of the applications of the technology and some of the consequences of the technology. What your listeners should be aware of is that, really, no one is saying that all biotechnology is bad. Even the proponents of biotechnology acknowledge that there are some legitimate questions about some of the applications. For example - human cloning is still not universally embraced by the biotechnology industry. It’s a big area of science, and we need to stop talking in generalities and start focusing on some of the specific applications. I think that is where we are going to make progress and sort of separate the wheat from the chaff.

Alex Avery: That’s where Chuck and I agree. Biotechnology is a tool. It can be used for both good and evil. Dynamite is a tool which has many good uses, but of course, you can use dynamite as a tool of war as well. So it’s neutral as a technology and how you can use it. Chuck and I agree on that point.

Where Chuck and I disagree is on the dangers, the risks, the need for the various technologies, and the impacts and applications of the various biotechnologies.

Host Jeff Ishee: Let me step in here and invite our callers join this conversation. The phone lines are open at *****. Dr. Benbrook, what are some of the most common uses of biotechnology, specifically genetically modified organisms in agriculture today. Farmers know the meaning of the term “Round-up Ready Soybeans” for instance, but many of our listeners may not be familiar with it. Give us a little bit of background.

Charles Benbrook: OK. There are two major categories of genetically engineered crops in use on some 65 million acres of farmland in the United States. One category involves soybeans, corn, cotton and canola varieties that have been genetically engineered to resist various herbicides. This is so farmers can spray over the top of a crop a broad spectrum herbicide and achieve weed control in a system that is simpler and more direct than many of today’s herbicide-based systems. The second category of genetically modified crops have been transformed to produce the toxin Bacillus

thurengensis, or “Bt” in plant cells so that when certain types of insect munch on the cotton or potato plant, they ingest a lethal dose of this natural endotoxin (Bt) and are controlled. Those are the two major categories and each one poses a different set of ecological risks, concerns and each raises different food safety questions.

Alex Avery: Let’s address the reason for the development of those two types of biotech crops. Chuck is right. Those are the two early major types of biotech crops in production.

The Round-up Ready and the herbicide tolerant crop varieties allow the use of weed killers, but that means you don’t have to plow. You don’t have to disturb the soil. You don’t have to churn it up to cut up the weeds and dislodge them. You can spray an herbicide and that leaves the roots and the what-not of the weeds in place. It doesn’t disturb the soil, so you get drastically lower soil erosion rates. It greatly simplifies crop production. It lowers fuel costs. It lowers soil compaction because you are not driving across the field as many times. There are enormous soil and sustainability benefits to using these herbicide tolerant crops.

The insect tolerant crops allow you to stop spraying broad spectrum insecticides in the field. Instead of going out and flying over with a helicopter and spraying these broad spectrum insecticides which kill everything, including the beneficial insects, you are only killing the insects that actually eat the crop you are trying to protect. Therefore, you get very specific control of the insects, and you leave many of the beneficial insects in the field. In fact, they are finding now wildlife coming into these fields that use these Bt genes because those insects aren’t killed by insecticides anymore.

Host Jeff Ishee: So what is all the controversy that we are seeing in front page news stories almost everyday about genetically modified organisms? Is this something that farmers accept, Alex?

Alex Avery: Oh. They’ve accepted it faster than any other agricultural technology ever invented. As Chuck mentioned, there are millions of acres in the U.S. now being planted to genetically modified crop varieties because it makes the farmers job much easier. It increases the success ratio of the crops. The goal is not to produce something in the field that the pests get, but produce something that we get. It lowers costs in pesticide uses in many cases, so farmers love it.

The consumers are a little more hesitant and . . .

Host Jeff Ishee: Let’s ask Dr. Benbrook about that. What is the reaction when you talk with consumers about this technology?

Charles Benbrook: I’d like to address both the perspective of the farmers and the consumers. On the consumers side, I think most people are just beginning to pay attention to what is going on in the food system. Many consumers are very interested in these new technologies and what benefits they might provide and what risks they might entail. I think that there is going to be a sustained effort to try to get information to consumers about these technologies which is balanced and objective. Also, there will no doubt have to be some sort of labeling scheme, because so much food is moved in global trade. Europeans, the Japanese, and most other developed nations either already have labeling requirements or are committed to a process which will have them in place within the next couple of years. So, consumers are beginning to pay attention. They are certainly concerned about some aspects, excited about others, and there is a great need for a lot of education.

From the farmer point of view, I think that some farmers are still wildly enthusiastic about Round-up

Ready soybeans or Bt corn; but a lot of others are beginning to realize that a lot of the benefits they have been promised were not as great, or as sustainable, as once thought. These are expensive technologies. Farmers are paying 3 or 4 times as much for soybean seeds that are Round-up Ready than what is called “bin run” bean seeds. There is a technology charge for Bt transgenic varieties that make the farmer pay more. There is a sober reevaluation going on in farm country about whether there is really any net benefit to farmers economically associated with these technologies. I don't know if Alex will admit it, but in a significant percentage of cases, farmers are reaching the judgement that they are really not better off by planting these varieties.

Alex Avery: Well yes. I dispute that, and we'll talk about that just after the break.

Host Jeff Ishee: Exactly. We do have to take a break at this point for a few commercial messages, and when we come back we'll get a response from Alex Avery. You are listening to the Valley Farm Forum on WSVB in Harrisonburg, Virginia.

-break-

Host Jeff Ishee: Welcome back to the Valley Farm Forum. We are discussing genetically modified organisms and the implications for agriculture. Our guests are Alex Avery and Dr. Charles Benbrook. I'd like to discuss the labeling requirements for GMO products, but before we move on, Alex, you wanted to respond to the comments concerning farmers and biotechnology.

Alex Avery: Yes. I want to respond to what Chuck said about farmers having a hard, sober look at biotechnology and that some of them are saying “No thank you.”

That's actually not true. Despite some rumblings of consumer concern, there are a whole bunch of farmers, the vast majority of farmers who planted them (GMOs) last year and are going to plant them again this year. Yes, they do pay a higher fee for those seeds, a technology fee, but because they use less pesticides and less passes with their equipment which increases the ease of the management of their crops, the farmers are saying this is a net benefit for me. My productivity is higher. My return on my investment, even though I am paying more, is at least as good if not higher. That's why, even despite these rumblings of consumer concern, most farmers who planted it last year are going to plant it this year.

Host Jeff Ishee: I'd like to discuss the labeling issue. During the commercial break, Jim Britt, who is the producer of this program, brought up some valid points about labeling. Does the consumer have the right to know the process of how these foods are made?

Charles Benbrook: I think that they do. All of the consumer surveys show that a large majority of people want genetically modified food labeling. Some want to make a cultural or religious choice. Some are such big proponents of the technology, like Alex, that they want to know how they can support the companies that are developing the technology. Our whole country is based on freedom of choice and if the biotechnology industry is going to have much success introducing these new technologies, they are, at a minimum, going to have to respond to the legitimate consumer demand for labeling.

Alex Avery: Chuck, are you in favor of FDA, of government mandated, labeling of these products?

Charles Benbrook: The government will manage a process whereby the rules governing labels are hashed out involving experts in the food industry, the biotechnology industry, and the public health communities. Government always manages the process used to set such rules. That role will be played by FDA. But it's really up to the private sector to develop the rules and implement them along with what will be a major, sustained public education effort. This is so that people understand what the labels mean.

Alex Avery: I want to talk briefly about the history of labeling. In this country, the FDA has required labeling when the content of the food has been altered considerably from its historic past. We've all eaten potatoes for eons, but if you create a potato variety that is drastically different in content or composition from a traditional potato variety, there has been a labeling requirement - or if there has been a risk of allergic reactions, such as peanuts in ingredients. It's the content of the food, not the process by which that food was created or how it was developed. This was brought up in Vermont in the case of bovine growth hormones for dairy milk production. Vermont passed a law saying that if you used hormones in your milk production then you are going to have to label it. That labeling requirement was shot down by the Vermont Supreme Court under the freedom of commerce clause. If consumer demand was all it took to require specific information to be on a label, there would be no end to what would be required. We'd have labor unions demanding that the FDA label food whether it was produced by union workers, or Hispanics. There's just no end to that. The FDA has stuck to the content of the food. Is it different? Is it safe? And that's the important thing. The bottom line is that with these biotech products, the content of the food is not different. It's exactly the same.

The second point, on the process by which it was produced, is that most people think that biotechnology is new, and a lot of activists want to characterize it as a scary new technology that must be regulated very strictly, very intensively. For the past forty or fifty years, we've been doing genetic engineering of a much more scary, and I don't think that it's really scary, but from that perspective, a much more scary way, and that is when we bombard plants or animals with either radiation or with chemicals which cause mutations. Then we go in and see if there are any beneficial traits coming out of this mutant genesis. When they find them, they take those and they cross-breed. So we've created new plants, new crops that way for eons. That's not been regulated. That's not required labeling. If you tell people, "Do you want to eat food that has been mutated with radiation" they say "Heck no." But we've not required a label up to now.

Charles Benbrook: Jeff, Alex's description of why foods are labeled in this country is incomplete. Consumers have, in the past, in many instance insisted on many foods being labeled. For example, frozen chicken has to be labeled as "frozen." There is nothing substantially different from a fresh or frozen chicken. There is no biochemical difference between the birds and most of them are raised in the same way. But consumers have felt that there is a significant enough difference in the character of chicken between being fresh and frozen, that they've required, and the FDA has set in place a mechanism to label how food is preserved. I think the same will happen with biotechnology and GMO foods. There will be an agreed upon set of principles and criteria that will govern how to communicate to consumers about these new and novel foods, some of which may pose some risks to certain categories of consumers.

Alex Avery: What are the risks here? Right now we've got Europeans who are completely anti-biotech. We've got many nations completely anti-biotech, banning this technology without a single

realistic risk associated with it. We've not found a single problem with using these technologies. We've got activists who are fueling the fear of these foods . . .

Charles Benbrook: Well Alex, if you think there is not a single problem with these foods, then you need to start spending a little time reading the scientific literature. There is an abundance of research that shows problems that are being discovered with genetically transformed foods. Tomato plants, cotton plants, sheep - all organisms have very elaborate defense mechanisms against the incorporation of foreign DNA, viruses, bacteria and microorganisms that aren't part of the organisms genome. That's why species are able to maintain their genetic integrity.

Alex Avery: No. they are not.

Charles Benbrook: Alex, Alex. I am on, so just let me finish.

Alex Avery: Well, I'm not going to let you mis-characterize it blatantly.

Charles Benbrook: The process of genetic transformation in creating a GMO food involves overcoming these natural defenses. What the recent science is showing, is that some of these genetic modifications are not as stable over time as once thought. And they are causing some unexpected silencing of certain genes. They are turning on other genes, and there are really unusual patterns of protein formation, and the stimulation of certain biosynthetic pathways, etc that can lead to the production of novel allergens or toxins, or influence the development of organisms. We are just beginning to understand how organisms counter-act genetic modification. The new science is saying that it is not as simple as we once thought. Sometimes it could lead to adverse safety risks.

Alex Avery: And that's why we have certain safety regulations of the genetically modified crops. That's why we have government oversight and safety testing. GMO foods are the most safety tested foods in human history. I'm still asking, Chuck, what are the risks that we have identified? What is the danger that justifies the banning of these technologies in so many countries. Can you name one Chuck?

Charles Benbrook: There hasn't been a ban, but there is a moratorium in Europe because the consensus of the scientific community in Europe is that there are enough unresolved questions about this technology that the work needs to be done before we universally start to introduce GMO foods into the human diet. I think that the big difference between Europe and the U.S. is the level of scientific certainty required prior to approval. I think that there is a recognition, even in the U.S., that there are some legitimate questions about these technologies that we have not explored enough. And some people are calling for a certain degree of humility about such fundamental transformation in something as basic as our diet.

Host Jeff Ishee: OK. We are going to take a short break. We'll be back in just a few moments discussing GMOs and the implications for agriculture. You are listening to the Valley Farm Forum on WSVA.

-break-

Host Jeff Ishee: Welcome to our program. You are listening to the Valley Farm Forum. Let's go right to the phones, where we have a caller waiting. Good morning you are on the air.

Caller: Yes. I was just wondering about the fertility of the food. Can it reproduce? And if it can't reproduce, do we run a risk of eliminating certain plants from the species?

Host Jeff Ishee: Are you asking about the nutrition content of GMO food? Does it change when we modify the food genetically? Is that your question?

Alex Avery: I think the caller is asking about out-crossing with wild species, or whether or not we are creating super-weeds.

Caller: Right. I'd heard something about the possibility of it maybe reducing the possibility of reproduction for the other crops.

Producer Jim Britt: Will Dolly the sheep be able to have a baby someday? If that's where all of our "dolly-the-sheep" will eventually come from.

Caller: (laughing) Right.

Alex Avery: There are a lot of GMO crops that can reproduce. They can generate seeds with identical traits. Farmers who buy these seeds have to sign an agreement that they are not going to reuse those seeds. In fact, some of the crops do out-cross with wild relatives of these crop varieties and can pass genes to wild relatives. That's a definite issue - more for the management, and for the longevity of this technology than for the ecological issue. If you give a weed herbicide tolerance, all that does is mean that that specific herbicide won't be as effective on that weed. But it doesn't give that weed any new ecological advantage. That weed isn't going to suddenly grow in an environment that it didn't normally grow in all of a sudden because it is suddenly herbicide tolerant. The super-weed myth, while a concern for the management of the technology, and the longevity in the use of the technology is not so much an ecological concern in my book.

Caller: Well, the other question that I have is: Then if the seeds . . . wouldn't the farmer then become dependant upon the provider of the seeds?

Alex Avery: Well, they already are. If you buy hybrid corn, which is a very productive type of corn, it doesn't produce a fertile seed. So you have to buy hybrid corn every year. That's been true since the thirties. That's nothing new. If the companies that develop these crop varieties can't generate a return on their investment, then they are not going to do it, and you are going to stifle all innovation.

Host Jeff Ishee: Let's get a response from Dr. Benbrook.

Charles Benbrook: A lot of issues just came up in a short amount of time. I think that a lot of the transformations that are being done now don't effect to any significant degree the fertility or the ability to grow subsequent generations. The caller may be thinking about something called the "Terminator" technology, which is an application of genetic engineering that renders the seed

harvested from a genetically modified variety sterile. For all intents and purpose, this is in perpetuity.

Host Jeff Ishee: I've heard this referred to as the "license to life."

Charles Benbrook: Well, it is exactly that. The purpose of the Terminator technology is to eliminate any opportunity for the farmer to save their seeds and replant them in the next year. It's a way to enforce intellectual property rights to genetic technologies. This Terminator technology has been a huge controversy around the world. Some of the biotechnology companies, including Monsanto, have pledged not to commercialize it, at least not at the present time. Still, there is clearly a lot of work going on in the major biotech/pesticide seed companies to utilize this technique to, in effect, make the farmer even more dependant upon these companies for buying what they call "packages of technology" where you've got to buy the seed, the pesticide, maybe some chemical that triggers a certain genetic trait. This development worries a lot of farmers.

Alex Avery: Yeah. But if the "seed packages" weren't proving beneficial to the farmer, if he wasn't getting a higher return or a lower management load on the farm, he wouldn't buy the technology. He would just continue to save the seeds from last year. It's not as if this is a new, totalitarian seed distribution system

Charles Benbrook: Well, but it is new Alex. You've got three or four seed companies controlling the vast majority . . .

Alex Avery: And competing against each other.

Charles Benbrook: It's already clear that a lot of corn farmers aren't going to be able to buy non-GMO corn in the varieties that are best suited to their soils and climates this year because the companies have chosen to commit such a large portion of their seed production to the GMO varieties. The whole question of who controls the genetic characteristics of seed varieties that are offered to farmers is definitely one of the emerging policy issues that is not going to go away.

Producer Jim Britt: Isn't that the reason why they just sued Microsoft in a similar situation? Maybe I can get the seed cheaper from one guy, but if I'm totally dependant upon the pesticide or something else, they are forcing me to buy the whole package. That's the bundling that the Justice Department sued Microsoft over.

Alex Avery: Well, then there's a fallacy, I think, in the Microsoft case as there is in the case here. Farmers can still grow the traditional land-raised varieties. They'd be beholden to no one. They wouldn't have to use any chemical they didn't want to. They have the utmost freedom. Farmers are choosing to use these technologies and to use specific seeds because they confer a benefit. They increase the productivity and the profitability. They lower the management costs.

Producer Jim Britt: What if I just want to buy the seed from, say one from column A, one from column B, and so forth, should I not have the right to do that?

Alex Avery: Don't the companies have the right to say "Look. If we are selling both the seed and the

chemical, and you are going to buy one, then you have to buy the other.” If you don’t want to play that game, don’t buy that seed. That’s the nature of the free market.

Producer Jim Britt: But as you just said, you’ve only got four companies that are basically monopolizing the

Alex Avery: How many companies do you need to have effective competition?

Charles Benbrook: More than four Alex.

Alex Avery: I don’t think your characterization that there are only four companies out there is accurate. Nor, do I think that your characterization that there isn’t competition out there is accurate. These seed companies are viciously competing with each other on price, and they are cutting their sales staff. They are cutting the research and development staff to keep the prices low enough that farmers will buy this technology. That’s the untold story here. There is enough of a benefit that the developers of this technology can charge that large a licensing fee. These things don’t cost that much more than regular seed, because the competition doesn’t allow it.

Host Jeff Ishee: OK. We are going to take another short break, but I’d like to ask a question before we wrap up this hour. Why does Frito-Lay refuse to buy GMO corn? We also have callers waiting to ask their own questions, and we’ll get to you as soon as we can. We’ll be back in just a few moments. You are listening to the Valley Farm Forum on WSVA.

-break-

Host Jeff Ishee: Welcome back to the Valley Farm Forum. Let’s go right to the phones and talk with a caller who has been waiting patiently. Good morning. You are on the air.

Caller: I’m kind of a timid consumer, and this issue is beginning to come to my attention. I’m a little concerned about technology in love with itself. I remember when, in the forties, when we were faced with DDT, and I’m a little concerned about eating something that is described, and this is a term I’ve heard used, I’m concerned about eating corn that is classified as a pesticide. It makes me at least want to have labeling so that I can make a decision about all of this.

Alex Avery: The corn that is classified as a pesticide, that is a technical definition, that pesticide doesn’t impact you whatsoever.

Host Jeff Ishee: But a lot of people don’t understand that Alex.

Caller: That’s what I’m saying. I don’t understand it.

Alex Avery: The pesticide they are talking about is a biological pesticide that is used extensively by organic farmers. It’s a protein - a natural protein produced by a bacterium. You digest that protein just like you digest a corn protein or anything else. That’s why organic farmers use it, and that’s why they incorporated it into these plants.

I want to hit, before we finish the hour, why we should embrace this technology. What is the need for this technology other than, as a lot of people want to say, for the chemical companies to control the market and expand the life of their pesticides?

The reason why we should embrace this technology is, number one, a more precise, more specific, targeted way of improving our crops and our livestock, which we've been doing for eons. But, we've got a global population that's going to grow another 50% over the next fifty years. The majority of that population growth is going to occur in the third world, which is getting unprecedented economic growth despite the Asian economy bump a couple of years ago. These people are eating a lot more meat, milk and eggs. We are talking about at least doubling, more like a tripling of the world's effective food demand over the next fifty years. We are already using more than one third of the earth's total land surface for agriculture. That means we've taken a third of the planet's ecosystem away from wildlife for human needs. This technology is going to allow us to increase the safety of the food supply, because we are no longer going to do willy-nilly muta-genesis with radioactivity and chemicals to try to improve our crops. We are going to do it in a more targeted way. It's going to allow us to improve the nutritional content. We've got a rice that was developed by the Rockefeller Foundation that will eliminate blindness in a couple of million children every year from a vitamin A deficiency. It will increase the iron availability in these cultures, which impacts newborns. You are going to be able to buy oils that are twice as healthy as current oils. You are going to be able to . . .

Host Jeff Ishee: Alex. I've got jump in here, only because of the constraints of time. I do want to have Dr. Benbrook respond to the caller's question. And caller, I want to make sure that I understand this - that you are not comfortable with the fact that your corn is labeled as a pesticide.

Caller: It makes me nervous. Yes.

Host Jeff Ishee: Why so?

Caller: Well, if the corn is a pesticide and the cow is eating the corn and I am eating the cow . . . I think we got a fairly comforting description just then, but there is so much of it out there.

Host Jeff Ishee: Dr. Benbrook, what is your response?

Charles Benbrook: First of all, caller, I don't suspect that you've been reading some of the recent Proceedings of the National Academy of Sciences and other technical journals . . .

Caller: Not recently. (laughing) I haven't.

Charles Benbrook: There is actually some very recent evidence that shows we have kind of missed part of what happens when ruminants, or humans for that matter, ingest genetically engineered corn expressing this Bt natural insecticide. The new science does not prove that there is a big health risk or problem. But, the new science shows that there is, in fact, some uptake by mammals through the digestive system of genetically engineered DNA from these corn plants. This is very recent, very technical science that the regulatory agencies are just beginning to focus on. I think, caller, that your gut sense that maybe we just don't understand everything about this is exactly why Frito-Lay and several other food companies have taken the precautionary steps that they have, to defend consumer

confidence in brand names. Frito-Lay corn chips is one of the Cadillac brands in America, and . . .

Caller: You're right. That's what I buy.

Charles Benbrook: . . . They don't want to trade what it's taken them thirty years to build up, in terms of consumer brand confidence and loyalty, for no substantial benefit to consumers or themselves. That's why I think you are going to see most major food processing companies over the next few years say "Thanks, but no thanks." There are really too many outstanding questions, and too many costs involved in trying to use these technologies.

Host Jeff Ishee: Caller, we certainly appreciate your input in this conversation about genetically modified organisms. We only have a couple of moments left. For our listeners who would like to learn more about this issue, I'd like for both Alex Avery and Dr. Charles Benbrook to tell us about their web sites and how we can learn more.

Charles Benbrook: www.biotech-info.net

Alex Avery: www.cgfi.com

Host Jeff Ishee: Gentlemen. I want to thank both of you for a fascinating conversation this morning. You have both provided an immense amount of information about genetically modified organisms and the impact on agriculture. Thank you once again for joining us in this edition of the Valley Farm Forum.