

## **INNOVATIONS & COLLABORATIONS AGAINST HUNGER**

***HUNGER, NUTRITION & STEM – Greg Fripp***

October 13, 2015 - 10:10 a.m.

### **Stephen Lauer**

Program Coordinator - World Food Prize Foundation

---

Our next speaker also came from out of state, from Omaha, Nebraska. We have Greg Fripp. He's the founder and executive director of Whispering Roots, which is a nonprofit doing really innovative work connecting science, technology, education and math, or STEM education, horticulture, nutrition and food in neighborhoods that are typically quite underserved. And so he's doing a great work in Omaha, and some of that is through partnerships with Iowa universities.

So please join me in welcoming Mr. Greg Fripp.

## **HUNGER, NUTRITION & STEM**

### **Greg Fripp**

Founder and Executive Director, Whispering Roots

---

Yeah, I'm a little tired, had to roll in from Omaha, so I guess I have 65 minutes to talk – is that what you said? We were doing a sustainable agriculture research and education presentation last night, and we got done late, so I think I got in bed about 1:15. My alarm went off about 4:30, 5 o'clock this morning. So let me get a handheld, so I can move around. I'm ready, yeah.

Whispering Roots – so we are a 501(c)(3) nonprofit based out of Omaha, Nebraska. I'll give you a quick little bit about my background. You know, there's been a lot that's been going on this morning – people talking about working with kids, talking about changing things. Well, actually, my degree is MIS – I'm a computer guy. I was a Navy officer for five and a half years, and then I ran Talent Acquisition for TD Ameritrade until about July of 2010 when I walked away from TD Ameritrade to do this work. So I walked away from a really good-paying job because I didn't want to look back later in life and say that I should have done more to help when I had the opportunity to do that. So that's what Whispering Roots is all about. We were actually born out of an idea from July of 2010. So that's our Web address, that's my phone number – please don't call it. That's my email address as well.

So what's our vision. Our vision is to change how the public views hunger, agriculture and education – that's our goal; that's what we want to do. We want to provide fresh, locally grown, healthy food for socially and economically disadvantaged communities, both urban and rural.

We use aquaponics, hydroponics, urban farming, controlled-environment agriculture – that’s what we do. We spend a lot of time in schools; provide pesticide-free, healthy produce.

We want to teach the principles of science, technology, engineering and math, STEM. We’re now going from STEM to STEAM, science, technology, engineering, art and math, and then by using hands-on experiential learning; so everything that we do is hands-on, integrated science. You can see that. On the bottom right-hand side, that’s one of our aquaponics systems. How many people are familiar with aquaponics? Yeah, a few, good, so we’ll talk about that. And then you can see one of our aquaponics systems growing food, basically using fish water, fish waste, fish poop. You know, if you say “poop” to a third grader, you’re a hero – did you know that? Yeah, yeah, see, look – you’re all laughing. It works, so there you go.

And then we talk about integrating, getting people involved in schools. We do a lot with service learning, using our students from our universities to come down and work with our kids in the schools. In the bottom left-hand corner, actually the young lady in the blue shirt – that’s my daughter; she’s a junior at UNO, University of Nebraska Omaha, so she comes into the schools and teaches as well.

So what do we do? I ask myself, if someone wants us to collaborate with them – does it involve growing food, feeding people and educating the public? – and if not, then we don’t do it. I have this rule about staying in our lane – we know what we do well – and then we find other people to do everything else. But those are some of our kids, upper left. It’s an aquaponics system – the kids growing in the classroom. In the middle picture, that’s some of our kids in one of our schools. Teachers will grow food in the grow bed, and they’ll feed the kids right out of the grow bed, because we do a lot of work in underserved communities. And then in the bottom right-hand side, that’s some of our educational component. That’s actually a system that we built for the Henry Doorly Zoo. We were teaching their scientists how to run aquaponics systems, so now we have an aquaponics system running in both north and south Madagascar as part of collaboration that we have with the Madagascar Biodiversity Project. Remember, we started in July of 2010.

So who are our project partners? These are some of our project partners. Just to kind of get a sense, we were talking about – what does it take to get this work done? Des Moines Public Schools – I actually have a meeting with them this afternoon and tomorrow. Iowa Western Community College, we do work with them; Vera Blue, that’s a company out of Iowa; the Nebraska Department of Agriculture, Department of Fisheries, Omaha Public Schools, Bellevue Public Schools, the SARE folks, University of Nebraska Omaha, Lincoln, Texas A&M, Cornell, University of Arizona, Henry Doorly Zoo. It takes all these people for us to do our work and get it done right.

But who are our real partners? If you look on the right-hand side, those are our real partners – right? – those youngsters, those smiling faces, kids in underserved communities that are trying to get healthy food and eat. This is why I do my work. Do those kids look disinterested in growing food and learning about nutrition?

Some of our collaborative projects – fall 2015, where are we? You can see we’re in middle schools, alternative schools, elementary schools, high schools, community colleges; Girls, Inc. is an afterschool program – some of you know might know about that. Wagner, South Dakota,

we're doing work up there with Native American tribes, using aquaponic systems to start teaching people about growing healthy food at the point of consumption, which is where we operate. And then on the right-hand side, that's some more of our kids in the classroom – that's a science classroom – planting growing, doing what we do best, which is growing healthy food.

So I'll tell you real quick – what is aquaponics? Aquaponics, we have some fish; we have them in a tank, doesn't matter the size, small and big. We feed those fish, they produce waste in the form of ammonia. That ammonia gets pumped up into a grow bed of some kind where we have two types of beneficial bacteria naturally occurring in nature. The bacteria eat the ammonia, convert it to nitrate, roots from our plants that also live in our grow bed, suck that nitrate out of the water, cleans the water for our fish; the plants grow nice and healthy, we dump the water back into our tanks, nice and clean. So what does that allow us to do? It allows us to grow about 30% more food than if we were growing traditionally, using about 90% less water. We were talking about water at the beginning of this session, healthy, clean water – yeah, that's what we do. It's a closed recirculating system. We tell people – think about a lake. You have fish swimming in a lake; those fish are producing waste. You have all that nice green growth around the outside of the lake, cleaning that water. That's what we do – we just put it in a box. This isn't new. Aztecs did this. It's just taken us this long to figure out that the Aztecs knew what they were doing – right? Uh-huh.

What does a basic system look like? And these are just a 4x4. When we go into the classroom, our kids, we bring all the materials – the wood, pipes, things like that. The kids have to cut, drill and assemble, and they have to build these systems from scratch, so we teach all the STEM principles while we're doing it with agriculture. Right? We use food to teach science and technology, engineering and math. Well, there it is, a little pump. We have a little tank, we have a little pump, we pump it up into a grow bed of some kind. Then we use a drain in the middle, we use a gravity flow, we use one pump. We try and use gravity as much as possible to conserve energy, because we also work in third world. In a third world area, people might not have access to the electrical grid, so they might be on solar. So we need to pull as little energy as possible. But our kids build these from scratch. Our kindergartners do not use circular saws, by the way. Somebody was talking about risk, I think, in the last presentation. Could you imagine that? Kindergartners put your circular saws away – naptime. Right? Yeah, right, there you go.

So what does an aquaponics look like? I mean there are different designs, but we've got one. You know, there's a bigger tank; it's got tilapia that are in there. We use tilapia and other types of fish, but we use tilapia because they're very fast growing. But this is a floating raft system; you can see some crops that are actually floating on water in the background. You see snow outside, right? This is controlled environment ag. But you have some fish tanks, you have some plumbing, you have some filtration of some kind, you have some grow beds where you grow your crops, and then that's it.

And what grows? What grows well? A variety of fish. We use tilapia, but you can use bass, bluegill. You know, we think about being appropriate where we go – what type of food do the people like to eat? What are they familiar with? And then we try and grow that. Lettuce grows well, peppers grow well, herbs grow well, cucumbers grow well, tomatoes grow well. We do all this with fish water, by the way. Cabbage grows well in the system. And if you see that system up there on top, look at all that fantastic produce – that's all growing off of fish water. And then

our friendly tilapia. Anybody eat tilapia, tilapia fans in here? Yeah. Our kids grow tilapia in the classroom – it's food; they're not pets, so we eat them. There we go.

But we talk about some of our larger systems, but you don't have to do this on a large scale. We talked about getting the children, because the children are the future. Anybody like to eat? Yes? Uh-huh, we'll be eating later. So you know what? We want these kids to learn how to grow food, because they're going to be feeding us tomorrow, right? We're teaching them today, they're feeding us tomorrow. But then you can use different types of systems. You use a system that's appropriate in size and scale for the classroom where you're operating – right? Doesn't have to be complicated.

Different type of opportunities. I talk really fast, because I only have four minutes. So different types of opportunities. If you look on the upper right, these are some of our students – that's in a highly Hispanic community where we operate as well – those kids, growing those seedlings. They're taking it down to their aquaponics system that actually sits in their main lobby of their school. But they grow everything from scratch. We do everything from scratch. We start from seed. But different opportunities – STEM education, right? Nutrition, hands-on experiential learning – that's what we do in integrated science. Next generation of agriculturists – yes? Local food production, growing food in food deserts at the point of consumption.

You look at the bottom left – that's some of our students at "Fun with Fish Day". We bring tilapia into the classroom or different types of fish. Do any of those children look disinterested in what we're doing? Look at that engagement. On the bottom right, I talked about growing cabbage. Those are some of our students – those are seventh graders, by the way. They grew that cabbage off of fish water. The cabbage for that young man right there on the right, on your left-hand side, that cabbage goes from his belly button all the way down to his knees. They grew that on fish water in the classroom, in the classroom.

Small-scale expectations. You say, can you really scale this up? What can you do with this? So we're doing this on a small scale. How does 1500 square feet of grow space sound, with about 1500 gallons of fish tank, about 11,000 gallons of total system volume at about approximately 500 pounds of fish and about 40,000 heads of lettuce per year? How does that sound? Not too bad off of fish water, right? And you can do this. People can learn how to do this. Like I said, the Aztecs did this. We're not crazy. They were feeding their people. That's a little floating raft there. But this is what's possible. Look at those gorgeous crops on the right. And this is only one way to produce food. Right? I'm not saying that we change the way that everybody's doing everything, but this is the way that we do it to help solve problems.

You say – Do people care about this? Some of the recent awards. So our children, I said we operate in underserved communities. One of our communities is one of the most impoverished African-American communities in the nation, so we went into that school. We put in an aquaponics system, started teaching STEM using agriculture. Our kids won the Samsung "Solve for Tomorrow" STEM competition for the state of Nebraska. They did it in under three years. They went on, they won in the national semi-finals, and then they made it all the way to national finals, one of the top 15 programs in the nation, in an underserved community using agriculture. Right?

EPA Presidential Environmental Educator Award, one of our teachers won that; the Presidential Award for Economic Development, we won that with the University of Nebraska Omaha, Whole Foods Friend of the Earth Award, Serve Nebraska, Doris Buffett Learning by Giving Foundation, American Culinary Foundation. Our kids are winning awards doing this stuff. They're going to be feeding us tomorrow.

And you might say – What's possible? Where can you take this? So when I started in July of 2010, I took no money whatsoever, no grant money, told my wife it'll be okay. Walked away from my job and said, it'll be okay, we'll make it. Spending my own money, I didn't take any grant money, because I wanted to prove what was possible. So from July of 2010 with one system in one school, this is what we're building right now. This is our new headquarters that's going to be going up in Omaha in a very underserved community. This is about an 18,000-square-foot facility. It has about a 5,000 or 6,000-square-foot greenhouse that sits on top of our offices that sits on top of our aquaculture tanks, so we can start educating more people. We thought we were going to need to be this big, we realized we're going to need to be this big, because the problem is so huge and also because we're doing work overseas in Madagascar. We're doing work in Haiti. So we're trying to train people today to send overseas so that they can train people to become self-sufficient and independent. But this is what we do. And we found out that doing something like this while running our smaller systems in the classroom is how we change things over time. Right? That's how we get the children. We work with the kids in the United States, because we're going to train the children overseas, because they are the future overseas as well; it becomes natural, second nature for them.

So that's what we do. This is what's possible. We're hoping this is ready in 2017. And that's our presentation on Whispering Roots. If you're interested in talking to me afterwards, please do or drop me an email, or don't call me – I'm just kidding.

## Q&A

A Any questions? Yes, ma'am.

Q Do you have any plans for Whispering Roots to expand across the Midwest?

A We actually do. That's why we're meeting with the folks from Central Campus; so we're with Des Moines Public Schools today. We're working with Iowa Western as well; they're actually putting together some work for us at the community school.

Q Do you only work in schools?

A Depends upon the school. We're actually in the school integrating the curriculum. We are afterschool; we're afterschool programs. We are just engagement, where we come in and we bring in materials with us. So we sit down with each individual school, figure out what the need is, and then we design a program around that. We operate outside of the schools but provide support too. Is there one other question? Yes, sir.

Q The city of Des Moines has over 2,000 empty lots where we could be teaching. Even if we took 10% of them, we could be teaching, and kids could be growing food that they need in their lives, and it's not being done by the city.

A They really could, and I know they're probably ready for the next person. But they really could. In my longer presentation, about an hour, we talk about that. We actually helped the city of Omaha rewrite the rules regarding using city lots, so that now people from the community can use city lots to grow food. That's a big initiative for us as well. All right.

Well, thank you very much. I appreciate it.

### **Ambassador Quinn**

So Natalie Hahn from Nebraska called me up, and she said, "I know this really terrific guy from Omaha is doing an amazing thing, named Greg Fripp, and said, "Why don't you invite him over." And I said, "Hey, Natalie, come on. Nebraska beat Iowa in football last year." But I said, all right, because everybody she recommends is just terrific. Wow! You're sensational. So that was great. We had Emma Naluyima here a year ago from Uganda. She's doing the same thing about demonstrations. This is how smallholders all across Africa can be uplifted, how you make things all work together, so it's great. Congratulations on what you're doing.