International Ag Labs

Jon Frank Interview with Duane Headings

Mr. Jon Frank: First of all, I'd like to welcome everybody who's calling in and listening. Thank you. And we hope you can find some encouragement and some value from this call.

I also want to thank Duane for agreeing to spend some time and share some of his stories and what he's observed and seen.

And before we jump right into the call, I just wanted to give a little bit of an overview of the Call to Arms, what it's about and what's spawning these phone calls.

Call to Arms is a market garden seminar where we're helping to lay out a roadmap, or a plan, for market gardeners to understand what are the critical tools it takes to achieve nutrient density. And if you want a full discussion of nutrient density, we're referencing foods with more nutrition, higher both of the minerals, the phytonutrients and even those essential sugars that science is discovering how significant the sugars are for cellular health.

That's what we're talking about, growing foods that in practical terms taste a lot better and bring customers back again because the flavors are superior. And so, we're laying out these tools.

On this call, we're looking at some of the experiences that Duane has seen looking at market gardens, looking at backyard gardens, looking at even row crops and larger scale production and seeing the effects of the fertility recommendations from International Ag Labs, which is basically the Reams Program. And I'd like to mention at the beginning, if you have any questions for Duane or I to look at, please feel free to email me at jon.frank@aglabs.com.

So, with that, I'd like to introduce Duane. Duane's been working with International Ag Labs as a dealer for a few years now and really has learned the principles and paid his dues to understand the system. And so now, it's time to see from his eyes some things which are happening.

So, Duane, why don't you tell just a little bit about yourself, and then we'll go from there.

Mr. Duane: Thank you, Jon.

We live in northern Arkansas and there's a lot of rocks and a lot of clay here. And so, gardening isn't, you would say, a walk in the park.

Before I started with International Ag Labs, we were trying to garden down here and we weren't having very good luck. And I told my wife, either we're gonna have a good garden or we're not gonna garden at all.

And so, we tried a lot of stuff, and I found International Ag Labs. And I still remember the first day that I called up there and Dan Skow answered the phone. And I said, “I've got potato beetles on my potatoes.” He said, “Oh? Well, you don't have high brix potatoes.” I said, “High brix, what do you mean?” He said, “Well, the sugars aren't high enough.”

And so, it kind of went from there and we started soil testing, and we started seeing phenomenal results right away. In the summer of '06, we did a soil test. The end of May, we dug out our carrots and the brix was 3 and they tasted horrible and the children didn't like them. And anyway, we applied first broadcast June 1. And by the fall, we dug carrots and the brix was 13.

Mr. Jon Frank: Of the same year?

Mr. Duane: The same year, the same identical year. And the children really liked them and they kept in the refrigerator for three and a half months just like the day they came out of the garden. We finished them off in about three and a half months.

We decided we were onto something, and so we tested again, put on the fall broadcast and started the next spring. And the first thing we noticed was that the emergence for the germination of the seeds was a lot better. They just came popping out of the ground “with an attitude” you might say.

And the early stuff, we noticed the lettuce was sweeter and the green peas were sweeter. And so, as the summer progressed, another thing that we saw was the species of weeds changed. At first we had thorny weeds, weeds that would have stickers and thorns. In the spring of '06, our children didn't like to go to the garden barefoot because it hurt their feet.

In the summer of '07, we noticed that the species of weeds had changed. We still had weeds, but they had changed so that the children could go to the garden barefoot. And so, that was real nice. We were looking for food quality and we thought this was a really nice experience to have the weeds change like that.

Anyway, in that summer then, we harvested some cherry tomatoes that went 13 brix. And the plants produced so much, we couldn't eat all of it. I'd go out there evenings and I'd pick a 13 quart bowl full of cherry tomatoes. And one evening, I counted them just out of curiosity and I picked over 1,000 tomatoes in one evening. And those were the ripe ones and there were lots of green ones on there.

Mr. Jon Frank: On how many plants?

Mr. Duane: One.

Mr. Jon Frank: One plant.

Mr. Duane: One yellow plant. It was a sun sugar--sun sugar was the name. And off the red one--we had a red one--I can't remember the name of the red one, but I picked 537 off of

that red one that evening. So, the production was absolutely more than anything we had ever seen or experienced.

And I was taking these tomatoes--I gave some to some of my customers, and then I took them over to the health food store a couple times and they started buying them.

Anyway, about the third time I went in there with these tomatoes, I had them bagged up and the owner's wife was there at the counter. And when she saw those tomatoes, she said, “Duane, those aren't going on the shelf. Those are going home with me. I'm gonna be selfish. My children eat those like candy. I don't know what you're doing, but boy, that's good!” So, I thought that was a good testimony.

Mr. Jon Frank: Oh, I've heard the same story from other customers - they're just too good to give away. I'm keeping all of these for myself. It was again high brix tomatoes.

Mr. Duane: A 13 brix tomato will taste different than--I don't know how to explain it. You have to taste it to believe it. It is really something.

And then, that summer, we also harvested a 10 pound sweet potato and a seven pound sweet potato, and then we knew we were onto something. And I took those sweet potatoes up to the local orchard to weigh them on one of their scales, and she said, “Well, that's a baby there. That's not a potato.” It weighed

ten pounds and two ounces. That was exactly my weight when I was born.

And so, overall, that year, in '07, we just had a wonderful year. We had the onions go from a brix of 5 to 12. We had the green beans go from about a 4 to a 9. And everything just really improved.

The soil loosened up. Before we started, the soil was so hard that I had to use the claws of a hammer to take a soil sample. And by the end of '07, I could dig down with my bare hands 8, 10, 12 inches in various areas of the garden.

Mr. Jon Frank: Now, all of this happened because you just made a call to International Ag Labs and talked to Dr. Skow who said you don't have high brix?

Mr. Duane: I guess, and I just believed what you guys told me and I just put it on. I said I'm gonna try something.

Mr. Jon Frank: Okay. Well, what was the difference? I mean, obviously, you did something different to go from such low brix to high brix. Can you describe what the process was that you were working on and what happened in between those two things?

Mr. Duane: Well, the first test came back that we were very low on calcium, we were very high on potassium and very high on phosphorus, and the ratio between phosphorus and potassium was not correct. I started talking with you and you

explained to me why that ratio is so important and that I'll be a professional weed grower until that ratio of phosphorus to potassium does improve.

And so, the number one rule you taught me was if you have too much of something, don't put more on, and if you don't have enough of something, put more on. So we started with a dry broadcast. We put on a couple different forms of calcium and you started educating me about the energy in the soil, how important it is to keep the energy up in the soil. And that was a big thing that summer.

And then, we also started with the foliar feeding, and all three of those--1.) The dry broadcast, without that, I don't think anything will happen. 2.) And then, if you don't keep the ergs up with the nutrient drenches throughout the season, you don't get plant performance. 3.) And then, the foliar sprays really pushed the production for us that first year, I could see that.

Because if you put on a foliar spray that's appropriate for the plant, what we saw was that the amount of flowers that those tomatoes put on and the amount of flowers that the okra put on and the zucchini--they just flowered like you wouldn't believe.

Mr. Jon Frank: That's amazing. And so, you attributed all three things working together - the broadcast, the nutrient

drenches for the energy and the foliar spray to really push the performance of the plants.

Mr. Duane: Very much.

Mr. Jon Frank: Well, that is part of our High Brix Gardens Program. And if people are interested, they can always get some more information from us on that.

And that really led to a lot of people seeing that there's a difference. Go on and keep telling your story. It's very interesting.

Mr. Duane: Well, I was just gonna say, the okra, we had to pick the okra every day to keep it from getting too big. The zucchini was the same way. We just had a wonderful year. And that was the first year.

But, what happened then is we began to see as the summer went on, it started--what should I say--regressing kind of. We saw that stuff started to fall off a little bit. It didn't do quite as well.

And so, when we came back and tested again, we did another soil test that fall and when we came back with that fall broadcast--what I'm trying to say here is it seemed like the broadcast we had put on, that really brought us an energy flush. But then, you have to do it again, and you have to do it again to keep on building because being the phosphorus and the potassium were too high, we had to keep on putting on calcium.

And we did that broadcast again and we put up our greenhouse for the winter, our winter green crops - lettuce, kale and so on. And we raised some kale that was 9 brix and some lettuce that was 8 brix. And that was the highest brix greens we had ever had up to that time.

And I remember putting that on the supper table and the children--I told them, “Take a taste, take a little bit.” And they ate that and we sat around there like rabbits and we ate that bowl of greens empty before we ate anything else.

Mr. Jon Frank: Now, did you eat the kale, just straight kale by itself?

Mr. Duane: Just straight kale by itself.

Mr. Jon Frank: Wow. That is very interesting. You know, I find that the most honest people to tell you if something is good or not, if you don't have a refractometer, is just ask children. Put stuff out and say, “Try a little taste,” like you did, and you'll get the honest answer.

Mr. Duane: They won't eat it if they don't like it, that's for sure.

Mr. Jon Frank: That's right. And that's a natural God-given instinct that they have just to teach us parents, you know, what we're putting in front of our kids.

Mr. Jon Frank: You know, I haven’t talked to anybody that had higher than an 8 brix lettuce. So, I don't know if you've seen or talked to anybody that had a higher level, Duane?

Mr. Duane: Not on lettuce.

Mr. Jon Frank: No, that's the highest I've heard.

Mr. Duane: I have on collards though.

Mr. Jon Frank: Yeah, collards and kale and things may-- I've heard of that going higher.

Mr. Duane: And it seems like the darker lettuce will have a higher brix than the light colored lettuce.

Mr. Jon Frank: Well, that's amazing. That must’ve had quite an impact then on your children's appreciation of vegetables.

Mr. Duane: Oh, it just made a big difference. Now they like to garden and they all help in the garden. And we dug the potatoes just with our hands that fall. It was easier than using a fork because the soil was so loose. And the year before, we had a disaster with the potatoes. We didn't have many at all.

That fall, I can't say we didn't have any potato beetles that year because we had just a couple here and there. I saw them. But, it didn't do any damage. Anyway, we harvested an average of 16 potatoes per hill.

Mr. Jon Frank: Wow.

Mr. Duane: And the year before, we had a failure. So, needless to say, we're very excited.

Mr. Jon Frank: Wow, that's amazing.

Then, you began working with us as a dealer helping other gardeners.

Mr. Duane: That's right.

Mr. Jon Frank: And what happened then in the next year? Do you want to continue your story of your garden or where do you want to go here?

Mr. Duane: Let's see--'08. We moved in '08. And so, we had to leave that garden and start over on another one. And it was actually in a worse position when we got this new garden than that other one was when we started.

The phosphorus was sky high, and the potassium was also very high. But, the calcium is higher. So, we don't have as far to go on the calcium, but the phosphorus is higher.

Tonight, for supper, I still ate some zucchini and radishes and cucumbers out of the garden. And they're not as good as what we had in the other garden, but they're improving.

This summer, when we came here, the lady that had the garden, her tomatoes were, oh, 3 I think, 3 brix. Her green beans were about 4. And now, our green beans are 6. Just by soil testing this summer and putting on one broadcast, we upped the brix of the green beans from 4 to 6.

Mr. Jon Frank: That's significant--that's a fabulous jump in that short of time.

Mr. Duane: And the taste is--you know, a 6 green bean isn't all that great, but it does taste like food. And a 4 brix will just kind of taste like dirty dishwater maybe. It doesn't really taste very good.

Mr. Jon Frank: And when you try to take that kind of a 4 brix bean, which is pretty common, when you take that to the market, there's not a lot of time that it'll last before it begins to break down.

Mr. Duane: Right. And the customers will buy it on appearance only and they probably won't be back. If they look good, you'll sell them. But then, if they don't taste good, they'll just kind of forget to come back.

Mr. Jon Frank: One of the things we find so frequently is that available calcium is short in a majority of the soils, not in every soil, but a majority. And it seems that the importance of calcium just about cannot be over-emphasized. It is the critical thing that determines and drives quality in produce.

Mr. Duane: And quantity.

Mr. Jon Frank: And quantity, that's right.

And when we start working on a garden, even on a garden that's very imbalanced, maybe very top heavy with a whole lot of phosphorus and potassium and not enough calcium, if we can

really start moving that calcium up, we can still make some change in the flavor and the quality as long as we're increasing the calcium availability. That's what I've been seeing in talking to some of the gardeners.

So, there is hope if you have a really imbalanced soil. But, most people are not checking. And so, the imbalance seems to be getting worse and worse if they're not changing their program according to the soil.

Mr. Duane: That's right. If you continue to put on calcium, it seems like you can sidestep maybe some of the negatives of that if you continue putting it on with your program. If you back off and don’t apply any, the soil reverts very quickly back to where it was. You know what I mean?

Mr. Jon Frank: Yes, I do. And even if you look at the soil test and it says you have 3,000 pounds of available calcium, but you have a very high level of phosphorus, if you'll keep putting low maintenance amounts or lower doses but still keep doing it, as you say, you're gonna see a lot better result than if you completely stop applying limestone.

Mr. Duane: And foliar spraying in that particular situation works very well.

Mr. Jon Frank: Right.

Mr. Duane: If you have a high--or not a high calcium, but say 3,000 pounds like you said, but your phosphorus is very

excessive and you continue putting on maintenance amounts of calcium and then your foliar spray, it seems that really improves the brix and the flavor and everything.

Mr. Jon Frank: Right. The overall goal of the high brix gardens programs was simply to help people grow nutrition in their own back yard. And so, that involves really just getting the nutrients out into the soil, and then use the nutrient drenches to keep the soil energy up and then foliar sprays really to get it up into the plant so that people can get the nutrition in their food.

And that's really where the market is moving toward. People are wanting better quality food. And we do have a question kind of right in line with this, so I'm just gonna work this right in.

It says, “Hello, Duane. Can you tell me is the brix in the leaf of a plant the same as the brix in the fruit of the plant?” And this comes from Richard.

Mr. Duane: The answer is no. It varies a lot from plant to plant as far as the fruit brix. The leaf brix would be something that might be, we try to keep it a little bit more stable through the different plants, like Dan Skow was saying last night that 12 seems to be a threshold number on the plant's sap, on the leaf, the brix of the leaf.

And there is a correlation. I don't want to say there isn't a correlation. But, I have checked tomato leaves and they were 12 brix and the fruit of that tomato plant was 4, which is poor.

So, there is a correlation, but there are issues to address besides just checking that leaf and they are not one in the same. It’s two different things.

Mr. Jon Frank: Right. And I would say the leaves are a sugar factory. And so, you can see how well is your plant working, making sugars on the leaves. The fruit or the tomato or whatever is kind of the cumulative overall health of that plant in its storage of those sugars, though I agree - it's gonna be different.

Mr. Duane: That's right. The tomatoes, you might say that is the warehouse then for the sugars that the leaves do produce from the sunshine.

Mr. Jon Frank: Right. So, continue on. What happened as you went on then?

Mr. Duane: Well, we started working with other people. They saw our garden, they saw our produce and they wanted to have some of that. And they wondered, how do you do this? Our garden does this, our garden does that and that's all.

We need to get a soil sample. You need to get an accurate soil sample because when I start--before I started with you,

Jon, International Ag Labs, I soil tested with a number of labs around the country and the results kept coming back that everything's fine, there's nothing wrong, you're in good shape. And I would have a sick field or a sick lawn or a sick garden in front of me. So, I knew that wasn't correct.

And then, when I talked to Dan Skow and I sent in a sample, it came back and said this soil is sick. And so, that was a real good day for me because I had found a lab that agreed with what the plants were telling me.

And so, when people ask me where shall I send the sample or I do have a soil sample, I ask, well, where is it from, what does it say. And so, I told them you have to take an accurate soil sample so you know where you are, so you know what you have to do to go where you want to go.

You want to have produce like we're having, so you need to find out where you are so you know how to go where we are. And we saw a lot--it seems like most--of the gardens have either compost or manures or mulches applied in the extreme so that the potassium and the phosphorus are way too high. That's just a common, very common problem because if a little is good, more is better seems to be human nature. And that's not really the case.

And so, I started working on my brothers' gardens, and then it just kept on expanding and expanding. The first thing

everybody comments on (it might not be always like this), but basically, the first thing that everybody comments on is the taste. There's always a taste improvement. They taste it the first year.

And then, the next thing they comment on is probably insect pressure. Insect pressure drops dramatically when the plants start to pick up the nutrients they need.

Mr. Jon Frank: Do you see that change on the first year mostly or you're seeing that more on the second year for the insects?

Mr. Duane: It does vary, but generally, the second year is a good year or I would say a much better year. The first year, sometimes, you see dramatic results like we did. Sometimes, you don't see as much. Generally, you'll see something. The plants will either look better, they'll produce more, the brix will be a little higher.

But, I know some gardens that were very slow in responding and I don't know why. And then, other gardens just kind of jump up and run.

Mr. Jon Frank: I have seen, just from talking to people, that in some way, shape or form, almost everybody I've talked to says they notice some positive influence/impact that's better than the year before. And it varies, but it's consistent that in some area, it's definitely better, noticeable.

Mr. Duane: Yes. That's what we see.

Mr. Jon Frank: So, you began to start working with other people and they were getting the soil tested then with International Ag Labs. And you put together a broadcast then?

Mr. Duane: Yes. We take soil tests and International Ag Labs makes the recommendations. And then I started doing the blending for a lot of the gardens and people would start putting that on. And that led into produce gardens, people that sell produce.

On the larger scale production, we are now seeing increases in production, and on a larger scale, it's different from a home garden. You can't manage it quite as intensively.

This brings to mind that one time, I was talking with David Yoder, and I said, “Calcium is king.” And he came back just like an echo and he said, “Management is queen.” And that is absolutely true.

It doesn't matter if it's a home garden or the market garden. But, what I'm saying is, in the market gardens, the results you see are very very good and very beneficial to the grower, so much so that they almost can't grasp what's happening sometimes, how fast the production is stepping up, how much more produce they have to sell with what they can do.

And on a home garden, you can manage it more intensively and you can step it up even faster than with the produce

gardens. But, the brix move up, the production goes up. The first thing we see on the produce gardens, I would say, is production. That's the first thing we see moving up is production.

And the brix move up a little bit. The squash bugs--the insect pressure starts going down very quickly also. It depends again on how far off ideal that the soil test shows. That's really a key factor in how soon you will see improvement is how far off is the soil to start with.

I use the example of two men running a race. Well, the one man can run 25 miles an hour and the other man can run 20 miles an hour. But, if the 20-mile-an-hour man only has a half mile to run and the 25-mile-an-hour man has a mile to run, who's gonna get there first?

It just depends on where you're starting from how soon and how dramatic your results are going to be.

Mr. Jon Frank: That is true. That's entirely true. And we definitely don't see the same results equally on gardens. They're all quite unique.

Mr. Duane: But, it's the only program that I know of and it's not that it's a program. Us consumers, us people, us gardeners are so used to buying a product that solves all your problems. You know, it's advertised as you can put this on and it doesn't matter from coast to coast, and it'll solve all your

problems. And that's not true because the gardens are not the same.

And so, with International Ag Labs, you address every garden separately, every field separately. Each one is unique. Therefore, we always see improvement.

Instead of, if you would try just (I don't want to name any products, but you can name any product on the market) and it might work for your neighbor and he comes over and says, “Look at these flowers! This is what I put on.”

“Oh, great,” you say, “I want some!” So, you take it home and try it on your flowers, and at best, they don’t do anything, and the worst case, they might die. Well, that's the way it is with gardens or produce or anything like that. There is no magic bullet.

And therefore, the unique thing about International Ag Labs is that you address each one's needs. Therefore, you get results because you're strengthening the weakest link in the chain.

Mr. Jon Frank: Right. The one thing that we make a pretty strong focus on is calcium. And a lot of standardized products, maybe like a Triple 15 or a Triple 10 or whatever, do not address the needs of calcium very well. And even if they're trying to, they're not seeing is it calcium that's available to the plant.

And so, I think that's one area that really can bring so much change in the produce quality is making sure that calcium is really addressed.

Mr. Duane: That brings up a story that I really like. My first cousin down here, he had potatoes. He was raising potatoes for market. And he called me one morning and said, “Duane, I have thousands of potato beetles. What can I do?”

Well, I said “Let's go out and take the energy, see what the energy is in that soil.” And it was low, and so we got together a nutrient drench to spray on the soil to bring the energy up, and also a foliar feed.

Mr. Jon Frank: Okay, let me stop you there just a second. I want to just mention--why don't you just very briefly explain what do you mean by checking the energy.

Mr. Duane: Okay.

By checking the energy, what we do is measure the capacity of the soil to carry an electrical charge or energy. We measure what the soil can carry, what the soil is capable of carrying.

Therefore, if it is low, you need to put out more nutrients so it is capable of carrying more or storing more or giving more to the plants, more energy. You need more nutrients out there. Nutrients are energy. Is that what you mean?

Mr. Jon Frank: Okay. Yes, there's soluble nutrients. And the effect of low energy or low carrying capacity is that the plants don't have energy to or to perform their functions.

Mr. Duane: And they don't have energy enough to be picking up enough minerals to build strong enough cell walls to resist the insect attacks, which is--it's not just about the strong cell walls. But, if a plant has enough nutrients, the insects don't attack it.

Mr. Jon Frank: So then, when you put together some nutrients, you are putting something that provided soluble nutrients in the soils? Is that what we're doing?

Mr. Duane: Yes.

Mr. Jon Frank: Okay. I didn't want to stop the story, but I wanted to make sure for people listening what it is that you're doing.

Mr. Duane: Sure. And we checked the energy with a meter. You buy a conductivity meter and anybody can do this and it's great to have one to check the energy in the soil and to see if that is the problem or if it's another problem.

Well, in this case, it was the problem. The energy was low. And so, we mixed up some soluble nutrients and we also used a foliar spray from International Ag Labs. And he called me 24 hours later, and he said, “Duane, you have to come see this. All those potato beetles moved out into the weeds.”

And I said, “I DO have to see this.” I drove up there and his potato patch was clean. I could not find one beetle in that potato patch, and that IS unusual. I mean, usually, you'll find one or two, but I couldn't find ONE.

And I walked out to the edge--well, the potato patch was right on the edge. So, there were tall weeds right beside it. And I walked out in there and there were THOUSANDS of potato beetles out there in the weeds. And that made a believer out of Jason Crup.

Mr. Jon Frank: That’s amazing. That’s a powerful story. I mean, that's amazing.

Mr. Duane: It's just, when you put down what is needed, it becomes a silver bullet.

Mr. Jon Frank: That's right. Now, let me ask you a question. Had Jason done the broadcast that year?

Mr. Duane: Yes, that's a good point.

Mr. Jon Frank: That's a very good point.

Mr. Duane: If he hadn't done that, why, I'm sure we wouldn’t have gotten the results that we did. Is that what you had in mind?

Mr. Jon Frank: Yes, that's part of it. But, the other point is the broadcast alone was insufficient.

Mr. Duane: Right.

Mr. Jon Frank: And you need more than just one tool. And I just kind of liken it to if you're a mechanic, you'd need more than a Phillips screwdriver. You're not gonna fix all problems with a Phillips screwdriver.

Mr. Duane: Yes. I like that.

Mr. Jon Frank: Okay.

So, you know what they say? If the only thing you have is a hammer, everything looks like a nail.

Mr. Duane: Yep.

Mr. Jon Frank: So, go ahead. That's great.

Mr. Duane: I'm sure that--and I've had people try this. They say, “Okay, Duane, what do you put on?” And I say, “Well, you need to soil test and you need to put on the dry broadcast. That's the foundation. You're laying the foundation. And then, you use these nutrient drenches and these foliar sprays.” And they said, “Okay, yeah, that looks good.”

And then, they would come back and they would look at their garden and, “My, that foliar spray really works. Can I buy some?” I say, “Yeah, yeah, you can buy some. But, you know, it might not do what it's doing on mine.” Well, they'd take it home anyway because they saw what it did on ours and they would spray it on and nothing happens. And they come back and say, “Well, hey, what's the problem?”

Or, one time, somebody got a foliar spray and took it home. They measured the brix before they put it on and then after they'd put it on and the brix went down actually. And I liken it to this. It's just like bouncing a golf ball off of a snow bank or a concrete wall. When you put down that broadcast and you start building the soil, then that foliar spray has a base to work off of.

If you don't put that down, it's just like throwing a golf ball into a snow bank. It just goes right on through and never comes back. That is what I see, you know, when people try that.

Mr. Jon Frank: Right. I agree. That's amazing.

So, I'm just gonna let you keep on talking. You're doing a great job.

Mr. Duane: Well, it's a lot of fun. It is so much fun to grow better vegetables and better fruits and the reward in eating it is just--you sit down and you eat a meal and it just feels great. You don't feel bloated. You don't feel heavy. It’s awesome.

And we're talking about life. It's actually bringing up the life in the soil. If you have a soil that is not balanced on the soil test, if the ratios aren't correct, the levels aren't correct, the life is compromised in that soil.

So really, what we're working with is life. We're getting out of the way or we're trying to stop doing the wrong thing and

starting to do the right thing because one thing that Dan SKow said one time in a conference really made an impression on me. He said, “If you do the right thing, the right thing will happen.”

Well, that's such a simple statement that it almost goes right on over your head. But, most of us miss it, you know?

Mr. Jon Frank: Right.

Mr. Duane: If you do the right thing, the right thing will happen. So, if you go to town and you buy something and you put it on and nothing happens, then it wasn't the right thing.

And when you start to realize that, you feel like you have a better handle on it. You can use your refractometer. You can say, “Well, is it working or isn't it working?”

And we had some peach trees this summer that we fertilized and then ate the peaches off of, and it was very interesting. I put the broadcast on last fall, and then this spring, I started kind of late doing the foliar feeding. I didn't get it done in time. And they started curling up a little bit, the peach tree leaves.

And so, I said, “Well, yeah, Duane, you need to get out there and do the foliar feeding because you're behind.” And so, I went out there and I started doing the foliar feeding and those leaves dropped off and I thought I was putting it on too heavy or something. And then, new leaves grew in. That was the

first time I ever saw that. The diseased leaves dropped off and new leaves grew on.

Mr. Jon Frank: And the new leaves came on in the summertime?

Mr. Duane: It was late spring, I would say. Let's see. It would have been the middle of May I think, something like that. It was late spring.

Mr. Jon Frank: Wow. Well, peach leaf curl is considered almost incurable among some people.

Mr. Duane: Really?

Mr. Jon Frank: Yes. It's a big problem out West. And I'm not sure that that's exactly what you had, but you're describing a symptom of that.

Mr. Duane: Yeah, I don't either. But, they just kind of curled up and wrinkled up. But, I was more amazed than anything when those new leaves came back on. And the owner of the property there, they never did anything with the trees or anything. I just asked her, “Can we fertilize this and see what happens?” She said, “I never saw those trees with that much peaches on them, never.” And she's had that property for years.

Well actually, she owned the property right beside it for years and she bought this property this summer. But, she had been beside those peach trees for years and she said, “I've never seen that one…” (She pointed out the one tree, there’re

six trees in a row.) …"with ONE peach." And it had peaches on it!

And we actually broke off one branch. We had one branch break off because I didn't prop it up like I should have.

Mr. Jon Frank: With the weight of the fruit?

Mr. Duane: Yes, with just the weight of the fruit, that's correct. We went from almost no peaches to breaking off a branch because we had so many and we had 13 brix peaches. That is not the best, but it tasted very good and I thought it was a giant step for the first year. That was in the first year.

Mr. Jon Frank: That's amazing.

And just out of curiosity, what were the things that you had to work on on the soil by that peach tree, what elements?

Mr. Duane: Calcium, just low calcium and the phosphorus and potassium were both--they weren't very excessive, but they were a little high. And then, the PH was high and you recommended a nutrient drench that helps to work against the high PH. And the traces--copper was low and manganese was low, and that seems to be about it. We applied those and it really helped it.

Mr. Jon Frank: **W**e've got a question here from David Ward. He wanted to know if you can add too much calcium.

Mr. Duane: Yes, you can. You can get too much of anything, including rain like we saw this spring. If you add

too much calcium, if you go to extreme with calcium, you will compromise life in the soil just like you do with any other element.

We can talk about how it affects this one and how it reacts with that one and how it changes the PH and how it does this. The bottom line is we damage the life in the soil if you go to excess on anything.

Mr. Jon Frank: Well, that's great. I'm gonna just take a couple questions here so I don't get too far behind on questions, and then I'll let you carry on with some of your stories.

David Ward also writes, I have multiple raised beds. Would you recommend the soil test be done on each bed or a composite soil test?

Mr. Duane: That depends on how the raised beds were made. If it was all the same material put into the raised beds and they were all handled alike, there is no reason to test them all separately that I know of. If they were treated differently, well then, yes.

Mr. Jon Frank: And it gets to be a little pragmatic too, you know, depending on how many there are, and maybe you can combine some areas that were treated together so that these areas are pretty much all grouped together. Maybe those areas are separated.

Mr. Duane: And then, it also depends on what you're growing. Of course, you wouldn't need to test that separately. If everything was the same, your soil test would be the same all the way across. But then, if you're growing blueberries in one and growing, let's say, zucchini in another, you wouldn't treat it the same, not at all.

Mr. Jon Frank: Right. I have seen a lot of soil tests where people send it in and they'll take multiple samples from the same garden with different beds. And in a lot of cases, you come up with the same pattern. And their fertility recommendations are very similar, but you might vary one--you know, just on a trace mineral or something, one needed it, one didn't.

In general, a lot of times it's the same pattern. But, if there's been an area that you had a bunch of manure on or compost and then you added a new bed that was completely un-amended, there would probably be quite a big difference then in that situation.

Mr. Duane: That's what we see. If something was dumped in one area, that makes a big difference.

Mr. Jon Frank: David Pelly had a question. He said, “Duane, what are your natural phosphate levels?” I suppose this is in reference to the gardens that you were talking about.

Mr. Duane: Well, they go all over. Let me see. The highest I've seen I believe was 3,600. And the lowest I've seen was 2. And so, naturally here in Arkansas as far as just the soil, not in a garden or something like that, generally we'll see levels in the 40s to 100.

And in Iowa, on the farms, it seems to run low. And in Illinois and in Missouri, it depends on what the soil was--I'm not sure what he's asking here. But, it seems generally on soil that isn't in a garden, it's low in phosphorus. That's a common problem.

But on a garden, it seems like if people have manure or something else, they put it on a garden. And so, most gardens, what I've seen in the last couple years, I've it's unusual to get a garden test in that's under 500 on phosphorus. That's kind of unusual. Sometimes you do.

Mr. Jon Frank: In your area.

Mr. Duane: Yes, in my area.

Mr. Jon Frank: Okay. What about your two gardens, on the first garden you had and now your new garden, what were your phosphorus levels there?

Mr. Duane: The new garden we have now, the phosphorus levels are 2,400 ounce and that's very extreme. On the garden that we had--let me see. Let me just look it up here while we're talking. That phosphorus level when we started was 536.

Mr. Jon Frank: Okay.

Mr. Duane: The calcium was 1,586. And the garden where we have now, the phosphorus level is 2,400 and the calcium is 3,600.

Mr. Jon Frank: So, they were quite different actually, weren't they?

Mr. Duane: Yeah.

Mr. Jon Frank: So, when you were working around with market gardens, what did you see in market gardens?

Mr. Duane: Well, when you start with a market garden, generally, you start in a greenhouse starting seeds and flats and starting your tomatoes or squash or whatever. And the first thing you often see is a potting soil with the energy too high for those little seedlings.

And I saw a lot of potassium and nitrogen too high in the potting soil. So therefore, the insects become a problem. That's where the market gardens kind of start and their problems start right there if they don't have a balanced potting soil.

Then, as you move on, they plant those out either into their greenhouses or into their fields. And some greenhouses have energy that's way too high. They have over-applied one thing or another, and some of them are very low and it's very hard to support those plants to get them growing.

And out in the fields, of course, with all the rain this year, it was a battle to try to keep the energy up in those market gardens. And the bottom line is they're almost always short on calcium, almost always.

And if you don't have adequate calcium levels, it is much harder to stabilize the energy in the soil. It's kind of back to that base you have to build on.

If you don't have calcium there, it's like trying to build on quicksand for a while. You have to throw in a lot of stuff to get it to hold, and then you can start building off of that.

And so, a lot of market gardeners are working on their base trying to build up something that will hold so they can build up on it, and so--especially out in the fields. And then, like I said, some of the greenhouses, why we were seeing energy way too high.

Mr. Jon Frank: Well, I would just like to comment that in the Call to Arms class, you're gonna be discussing in depth and demonstrating the taking of energy reading in the soil and your case study is gonna involve interviewing and talking with a couple growers who were really benefited by an understanding of checking the energy in the soil and how they had to, in order to manage it, **they were taking** the conductivity reading daily for a while I believe. And that had a big impact on their management once they used that tool. And so, I'm looking forward to it.

And I think, you know, we could say the broadcast is real important, the remineralization is real important, and it is, and the foliar spray is really important. But, the one key thing that a consultant and a lab cannot do is we cannot take energy reading for you ongoing.

And that's something that must be stressed. It's critically important for success. Keep the energy from extremes, not too low, not too high, create that right environment for optimum plant growth.

So, I think you've got a presentation that's really critical for farmers' success or market gardeners' success and their role that they need to be very active in.

Mr. Duane: It's absolutely key. It's the key thing. That brings out something. This summer, we had a lot of rain down here and that flushes out the nutrients in the soil. Therefore, the energy in the soil goes down and it can't support plant life as well.

And I was taking care of these nine tomato plants for a friend of mine, and I was watching the energy. And he was putting on the nutrients lots of times for me.

Well, one time, I got up there and he said, “Well, no, I didn't get it on this time.” And the ergs was down way low and I picked some tomatoes and brought them home. And the point I

want to make here is that the brix was down two points from the time I had picked before then. So, this energy thing is huge.

Mr. Jon Frank: What was the time difference?

Mr. Duane: The time difference was probably two weeks, I'd say, not more.

Mr. Jon Frank: Okay.

Mr. Duane: If the energy goes down, the brix goes down, the quantity goes down, they just kind of give up and sit there. Well, they just don't have any life to keep them going.

Mr. Jon Frank: That's amazing. It's pretty amazing that the brix just goes right down on the produce by a lack of or a dropping of the energy in the soil.

Mr. Duane: That was the first time I had witnessed such a dramatic drop like that. And so, for market gardeners, produce growers, it's a key thing to take those readings and to put on what you need to put on to keep that up. And that will work. That is probably the single most important thing a market gardener can do throughout the year.

Mr. Jon Frank: Right. It's amazing what we've seen. Would you just touch for a few minutes on fertigation. With market gardens we use fertigation a lot or drenches. But, with home gardens, we mostly just use nutrient drenches. And they're both fulfilling the same thing. They push the ergs back up.

What are you seeing with fertigation and what are people using now?

Mr. Duane: Well, people use a wide range of products. And there again, what we need to do is ask, “Does it work or doesn't it work?” And it comes right back down to using that ergs meter to see if what you're putting out is working.

But then, it's like Dan Skow said, “Do the right thing, then the results will come.” What I'm saying is, if you don't put out the right thing, you can actually increase the ergs and damage the plant performance. If you put out the right thing, you will increase the ergs and you will increase plant performance.

And what we saw a lot with putting it through the drip tape and so on and so forth was that you could impact the plant health. You could impact the quantity of the yield. You could impact the quality of the yield and you could help on the weak links in the chain.

Say, for instance, the calcium was real low, and so we would put out micronized lime, for instance, a real fine calcium that would go through the drip tape. And we actually saw the leaves on tomatoes increase in thickness and they felt much thicker and much tougher. And we would see mums that didn't want to flower. And we would put out the appropriate nutrient drench through the drip line and it helped them flower.

And so, with a drip tape underneath plastic, you can't do as much as you can with the broadcast, but you can change that little micro climate right around the roots and you can do a lot of good with that. You can add calcium by putting out micronized lime. You can add taste to the tomato by putting out other rock minerals. You can add soluble nutrients through the lime to address specific problems.

You can do a lot of things through the drip tape and we did a lot of things, but it's not as good as putting out the broadcast. But, it's a very valuable tool if you can determine what you need and then put that out through that drip line. You can benefit all those areas that I named off - quantity, quality, plant health, and you can also work on the insect pressure just by improving the nutrients there--[end of audio].

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