



## **Season 1 Episode 4 – Water Quality**

**August 22, 2022**

Speaker 1:

Welcome to the farming basics podcast with Olivia Fuller. We'll have sustainable farming tips from growers across the state and extension specialists at Auburn University.

Olivia Fuller:

Hello. It's Olivia Fuller here.

Jacob Kelly:

And Jacob Kelly. And we're both here with Dr. Camila Rodrigues. She's our assistant professor of horticulture at Auburn University and one of our food safety specialists. Welcome, Camila.

Camila Rodrigues:

Thank you for having me here today.

Jacob:

Yeah. We're glad to have you,

Olivia:

So we're going to talk a lot about water quality and she's on our commercial horticulture team as well. So-

Camila:

Yes, correct. I'm also in the food safety and quality team.

Olivia:

Perfect. So we're going to talk about how water quality relates to vegetable growers, and why is that so important?

Camila:

Yeah. Well, water quality and water testing. This is how you get to know the microbial quality of water. So if we talk about the current regulation, the produce safety rule and their FSMA and the FDA, they currently change for a new regulatory ag water support because before the regulation was around water testing. So growers had to build a microbial water quality profile based on several water testing for surface water and groundwater. But the FDA stepped back. They collected more information on research, and they came up with the proposed rule now for water, where they shifted the water testing for risk assessment for a water assessment plan. Where growers need to assess the water system, whether it is a surface water, open environment, whether it is well, how the well is maintained, how the water is applied to the field, overhead, drip, crops susceptibility. So whether it is a leaf green, which is more susceptible, or if you are growing above ground crops, and also land use. So especially related to animals in the surrounding area.

So FDA collected a lot of information and data, and they concluded that a lot of outbreaks that happened in the past were related to animals, livestock mostly. So that is the biggest concern now. Water test became optional right now. So it is an additional to all this water assessment plan. But then for growers to certify that they're doing all the assessments and they need to take corrective actions or not, testing their water, it is very important. And then testing their water in the right time. So in the growing season, before using the water, they should be testing to know what the quality of the water is. They should be testing around the growing season too. And most importantly, before harvesting close to the last water application. So they certified that the water, it was in a good microbial quality. When I say microbial, we use generic E. coli as an indicator for microbial quality.

Jacob:

Okay. So they do all their testing and things like that. And they're doing their soil amending, and they're getting ready for their growing season. What are some biological soil amendment practices that you recommend, so that they don't cross over any of those biologicals into that water supply and then contaminate their crops later on?

Camila:

So most importantly, we tell growers, if they want to use biological soil amendments of animal origin, they should properly treat the manure, the soil amendment. When I say properly treatment, it's a composting, following a scientific validated procedure. And then to avoid cross contamination in the fields too, if their

growers are doing this on the fields, keep those composting, those bios away or far from areas that could happen to run off and could contaminate water sources, could contaminate produce fields. Keep them segregated from raw manure, to your compost. So if you have mixed them up, then you consider everything that is contaminated, that is considered raw manure. And when we're talking about raw manure is a poultry, cows manure or agricultural teas or any fish emulsion as well. So most of the things that you avoid contamination in the field, especially... And then if you're applying manure in the field, compost... If you're applying properly treated compost on a produce field, the FDA, they produce a safety rule. Says that you don't need to follow a harvestable time period after application. You can apply today and harvest tomorrow, let's say.

But if you're using raw manure, the FDA recommends not using. But if you are using, they don't have a recommendation from time application and harvesting. But what most growers use is their requirements recommendation for national organic program which is 90 days of application, if you are applying on the crop that is not going to be touching the soil, or 120 days, if you are applying on the field that the crop or the harvestable portion is likely touching the soil or the ground.

Jacob:

So 120 days to 90 days for hot poop. And then when we are talking about composted manure, we can throw that out the day before. And as long as it's not coming into contact with our harvestable product.

Camila:

Yeah. So if it's properly treated, it has been treated to reduce to a certain safety level to be used in the field. So it needs to be properly treated. So when we talk about compost, growers need to understand that piling or [inaudible 00:06:56] stockpile is not composted, is not treated. They need to follow a validated procedure with the adequate temperature and all the records to make sure that it was properly done and properly treated. So it can be safely applied to the fields.

Jacob:

So if I buy composted manure from someone else, is there a certification or form, or should I just take their word for it?

Camila:

You should ask for a certification from the supplier that you are buying. So whenever they come to your farm to look at the records, you have a certification from your buyer that you are buying a compost that has been properly treated. So they need to have name of the procedure and then all the validations that it was properly composted.

Olivia:

So what if they get chicken litter, for example, that's not been composted and hasn't had time to be?

Camila:

Then you should treat it as a raw manure

Olivia:

And that means waiting the-

Camila:

A 190 days.

Olivia:

A 190 days. Okay. I just wanted to clarify that. Because I think this is very timely that we're doing this. With fertilizer prices being so high right now, everybody's wanting compost. So-

Camila:

But one thing we say is that those 120 days to 90 days is not a food safety requirement. It's not a food safety thing. It is the national organic program that dictates that. And the FDA is still working on collecting information and data regarding time of application and harvesting because there are several research and studies that demonstrated that salmonella and other pathogens can persist in amended soil for as long as 200 days or more. So that is something to think about if you are using raw manure. So my recommendation, personally, as a food safety specialist, I would say apply compost.

Olivia:

Right.

Camila:

Treated manure.

Olivia:

Right. Right. It just seems to be so hard to find right now. With the fertilizer prices being so high, everybody's buying up the compost, and it's a very sought after commodity right now, really. So-

Camila:

And we have abundance in the state.

Olivia:

Yes. Yes.

Camila:

But yeah, it just needs to be safely treated and applied.

Olivia:

Okay. My next question is taking us in a different direction, but something that I find very exciting with my work on pollinators. What is something that you emphasize when talking to a farmer about developing an own farm conservation plan?

Camila:

So what many people think and used to think in the past is that conservation practices and farming management practices were not aligned with food safety practices for a while, especially when we talk about wild animals and vegetation around water sources or route fields. And several studies have come up in the past years and confirming that conservation practices are in fact aligned with food safety practices. So not saying that you need to only focus on conservation or only focus on food safety. You need to have a balance between conservation and food safety. So as an example, if you remove vegetation around water sources, that could be a problem for water sources. It could increase contamination in water sources because if you are... Those vegetation around water sources, they can filter, some runoff and then prevent water from getting some contaminants that will come with regular rainfall.

Olivia:

Is this what we call buffer strips?

Speaker 4:

Yes. Correct. But sometimes growers will remove vegetation around the water sources to prevent attracting animals. Sometimes it can attract more animals. If you have open field, animals will come easily and get into the water or get close to the water, and then will contaminate as well. But it works as a buffer as a filter. When you're talking about wind breaks around the fields, they could help prevent aerosol from coming, from animal operations that are close. Maybe not on your operation, not in your farm, but on your neighbors and coming to your field, in an open field. We are talking about an open field. So that could also work as a barrier. Let's talk about pollinators. So when you are tracking pollinators, we are tracking native species. So few studies have come up recently showing that native birds, carry less human pathogens than migratory birds.

So when you have native birds and you have native insects and species, they help to keep away some of the migratory and no native species. So it has been also studied, and then it is been shown that they carry less pathogen compared to migratory birds or migratory species or no native species because they tend to be closer to animal operations. And if they come in contact with animals, livestock, they can contaminate fields when they come close, when they fly, when they defecate around. And then that could be a problem.

Olivia:

And that's very exciting to hear because we're working with farmers. Camila and I have actually started a pollinator program where we can go and help you on your farm, if you want to implement some of these native habitats and learn how to plant for pollinators because they do. They have so many benefits beyond just the obvious ones you. It even goes into the food safety realm.

Camila:

Yeah. Absolutely. So that's one way, I think we... Here in Alabama, we are very attracted to the conservation practices, and we promote that. Christine was one of our regional extension agent. She has a project. It is an amazing project, they call Farm Innovation Project that they talk a lot about conservation practice that growers can do on the farms and how to get resources through NRCS. But that is an interesting program, and then it is attracting a lot of growers and a lot of attention too.

Jacob:

So I'm a grower. I haven't been taking water samples from my surface pond, my surface water. How do I go about doing that? Can I just take the sample in a regular water bottle and send it off to a lab somewhere? How does that process work?

Camila:

That is a great question. So to align with that, I will tell you that fortunately, we're setting up a program this year, that's called Ag Water Safety Program that we will be offering produce growers free water testing and technical support, if they want to test their water, whether they have surface water or ground water. So for growers that want to test their water, the lab or us. But if they contact a certified lab, for example, they will provide the bottles. So it needs to be a sterile bottle. So it cannot be a water bottle that you get at home. And they'll give instructions on how to collect the sample. So it needs to be a representative of sample. So around a 100 ml sample that will be shipped into the lab, ideally within six hour., but we know that this is not reality. So what we say, we tell growers that, collect your water on your day and then ship it overnight to the lab.

Olivia:

And we also have a video on this too. I wanted to plug to make sure that our listeners knew that we do have resources, if you want to look up step by step on how to take that water sample.

Camila:

Yeah, absolutely. You can access on YouTube on Alabama Cooperative Extension System. You can find a small farm irrigation video series, is video six. There are instructions and how you can sample your water, I would say from a faucet. There are different other videos that you could look for sampling, testing, for sampling water from surface water. But it's basically the same procedure. So before sampling your water and sending it to the lab, give them a call and ask them if they'll prompt you, receive your sample because sometimes, you don't know if they're overwhelmed, if they're closed next day. Because the water would have to be analyzed within 24 hours maximum, so you get a representative and a correct number back.

Jacob:

Right. We need all that bacteria and all that to still be alive, so it shows up on the test, right?

Camila:

Yeah. You don't want to wait 48 hours or more because you don't get a valid test back. Also, make sure that you're not contaminating inside the bottle with your hand, and if you find something, normally bottles come with a white powder or tab inside, don't take it out. Don't toss it away. It is just a chemical to preserve water. Just leave it inside, collect the water, close it, put on our ice cooler and ship to the lab.

Jacob:

That's great. Do you have any more questions for her?

Olivia:

Was the new ag water rule that was proposed... Is that applied to all water use?

Camila:

No. Yeah. That is a good point. So the new FDA proposed rule for ag water is just for production water. So for harvesting and post harvest water, nothing changes. So it remains the same. So growers will have to do the micro water quality profile for ground water, and if they use municipal water, just get a certificate for the municipal source. But the rule just was proposed and modified for production water and not for post harvest water.

Olivia:

Thank you so much, Camila, for coming in. This is very helpful for our growers.

Jacob:

Yes. Thanks for coming in Dr. Rodriguez. It's always great to hear from you.

Camila:

Thank you so much for having me.

Speaker 1:

This has been a production of Alabama Extension at Auburn University.