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Intro: Welcome to the Young Farmers Food Safety Focus Group Series. I'm Maggie Kaiser, the Produce Safety Training Coordinator for the National Young Farmers Coalition. Throughout the summer of 2020, I, along with Bre Sliker, Billy Mitchell, and farmer facilitators from across the country, hosted a series of focus groups with farmers, where we discussed the challenges and successes of implementing various on-farm produce safety practices. And we recorded them. Because we want these conversations to be a resource for you, in every session we bring together farmers with similar experiences for a discussion about a specific farm food safety topic. We begin each one with a farmer presentation followed by a roundtable discussion where farmers share problems and solutions with one another. We hope you enjoy them and find some practical information for your farm.

[Music]

[1:04]

Maggie: All right y'all let's get started. So, hi everyone, welcome to this focus group. Today we're talking about managing produce safety risks associated with rotating livestock through our produce fields and orchards. My name is Maggie Kaiser. I'm the produce safety coordinator with the National Young Farmers Coalition and I'm also a farmer in New Orleans, so we'll start with some introductions with Billy and Bre and then kick it to all of you farmers on this call. So, I will pass it on to Billy.

[1:47]

Billy: Yes, hey y'all, my name is Billy Mitchell and I work for the National Farmers Union, I'm the Food Safety Modernization Act Training Coordinator, which means I just talk about food safety a lot. National Farmers Union is based out of DC, but I live in Brunswick, Georgia which is down on the coast. Bre, do you want to go next?

[2:09]

Bre: Hi everyone, my name is Bre and I am interning this summer with National Young Farmers Coalition with Maggie on the business services team. Currently, I am finishing up a graduate program at NYU in food studies.

[2:26]

Maggie: Harrison, I'll pass it to you next and we'll go around for all the people that are on this call, so it'll be Harrison, Jen, Ben and Caroline have you all introduce yourselves. Where are you coming from and why you wanted to be on this call today. Then we'll have Harrison go a little bit more in depth about his operation.

[2:53]

Harrison: Hi everybody, it's me, it's your boy. I'm here because Billy asked me to be here.

[3:02]

Maggie: Cool, will you pass it to the next person?

[3:08]

Jen: Yeah, I'm Jen. I am in Basalt, Colorado and I am the livestock and site lead for Rock Bottom Ranch and we're super diversified here. So, I run cattle, sheep, chickens and we used to do hogs, but we took a break on that. In the past, I managed a goat dairy in Pennsylvania for a few years, which is also just like rife with management on food safety for both pathogens, bacteria, and pharmaceutical residues. So, I think I

come with a breadth of stuff that I've dealt with in my years farming. Going forward, I'm also interested in learning about grazing and orchard systems in Silvopasture.

[3:56]

Ben: Thanks everybody, this is Ben. Caroline and I farm in northwest Larimer County or northwest Fort Collins area. The name of operation is Raising Roots Farm and we leased two different properties. We grow mostly diversified vegetables, and we raised pigs, chickens, and we're looking to add either sheep or cattle. We also rotate. We use the pigs as primary tillage on our poorest quality soil each season and then have figured out a rotation to follow them to optimize food safety. With nothing being harvested that touches the soil directly until year three following the pigs, we're always trying to make sure we're being clean and safe on relatively small spaces. This is definitely of interest to us.

[4:49]

Maggie: Thanks everyone and thanks for introducing yourselves despite I think all of you already knowing each other. I think we'll just jump right in and have Harrison start his presentation.

[5:04]

Harrison: Y'all mostly know me and I think you guys know quite a bit about my operation, but we raise fruit for a variety of markets, both commercial and direct consumer markets. We also raise sheep, which is a separate business. It's not always easy and I would not always call it advisable, but it is a pursuit that we are working towards. So, we have a Harmonized GAP audit every year. We're required to be Harmonized GAP certified, which means that we adhere to the Harmonized GAP standards that were created by USDA. We have a full food safety plan and keep records and have an annual audit. This is the language from our food safety plan as it pertains to raw manure and animals. So, the important part of anything in the food safety plan, whether we're talking about Harmonized GAP or whether we're talking about a GAP program at all, or FSMA, is that you have some scientific basis behind what you're doing. We cite the national organic standards program as the standard that we believe has the scientific basis to justify the practices that we that we use. The national organic standards program lines out that for crops that don't touch the ground, you have a 90-day buffer between the applications of raw manure and harvest, and for crops that do touch the ground they say 120-day buffer. You can see we basically cited for animal control and then with the application of raw manure we just restate that. Our record keeping is simple. We just write the last date that an animal was in one of the blocks that's going to have a harvestable crop. It is simple and not super intensive. We have sort of a nice situation right now, and this is sort of part of the interesting thing about livestock. So, this is a map of our one of our farms we operate two farms that are two towns apart. This farm is about 25 acres and where the livestock is housed. We don't really drive livestock back and forth yet. We may have to someday to have adequate pasture. You can see these two big blocks, which are the Cresthaven block, Sun Crest block are used as our new planting. So again, this isn't current at all, but the Cresthaven and the Sun Crest. That's probably a four-acre block right there, and right now, everything in there is not productive, so we really don't have any requirements for when we can have animals in there. We also, over here in the in the winesap HC Fuji H apples, we took out about an acre and a half that we're grafting. So again, we have another area that animals can move, but essentially a well-constructed orchard starts harvesting cherries at the end of June early July, and you'll have something consistently coming off the trees until about mid-October. So, the theory is that we can really graze up until about May in most things, except for Cherries and then we have a 90-day window that'll take us up to that that harvest date. So, we have to get almost all the animals out of production areas by May. Right now, they're in the nonproductive peach areas, but when those are productive we're going to have a real pickle and the theory is that if we can maintain about an acre to an acre and a half of good pasture, that should cover us for about a month or so that we need it to then we will be able to get back into the cherries after cherry harvest, which is done about mid-July. It's a real Rube Goldberg calendar of events that we have to meet in order to keep these things on grafts, which is one of the biggest challenges honestly. Anyways, we've got all these different blocks. Each one has a different marker for the last day that the animal can be in there. For the Peach 1 H, it's really the end of May, for some first Cresthaven they could probably go to Mid-May to grazing there, for Gala you could go about to the first day of June, for the lines at Honeycrisp Fuji Block, you get a little bit later than that but not by much, and for the Jonagold you could get a little later than that to around mid-to-late June. We use almost exclusively this woven netting because we've found that it's hard to keep

sheep in with anything but that. We've started having a little bit more luck with the with the three-strand system, which I still don't personally trust. The sheep cause a lot of damage if they get into the trees, so to me the best barrier is a real barrier. So, I'm most comfortable with this woven netting. The three strand again as has been working recently. We got into sheep because we inherited some from a nearby commercial operation. They were big and ornery. We now have a breed called Southdown baby dolls. They have a real small stature and are thick. They cut out well, so they've got a good hang wait and they don't seem to push the fence quite as much. They're still aggressive with the trees, so we use this wire mesh. We have about 30 sheep that we run. I honestly think that at the acreage we have and with the way that we graze, I think our capacity would probably max out at about 50. You are really limited in your ability to grow the flock and it's constantly that balance. I'll talk about that a little bit more. The reason we do it is, in theory, for soil health. This is the most recent soil health test that we took. We've had sheep grazing in the orchard now for approximately 3 years. You can see we've got a better exchange capacity in Hotchkiss; our organic matter is like a little bit higher in Hotchkiss. Otherwise, things are similar. I think one of the challenges is that we all go to the soil health conferences and we hear about how important animals are for a healthy system, and I'm certainly not one to contest that, but we may find that over a long period of time that we begin to see benefits that you can't see after three years. When you're talking about commercial crops, it's really the quality of a piece of fruit that you need for sale at grocery stores and to the expectations of consumers. It's hard to translate the same science that's really being pumped into how to make good pasture into making good commercial specialty crops. Those are two sorts of divergent areas in my experience. I also think that one of the challenges is having the numbers that really make an impact. I think even at 50 sheep you know we're still a far cry short of really making the animal impact that we would need to start seeing some of the some of the significant benefits. So, here's the rest. You can see things are similar between the two farms. The soil types are relatively similar. You can see a little bit higher ammonia and nitrate down at the bottom, which may have something to do with the sheep. Certainly, in the soil test I can't see anything right now that that seems to be indicating that we're making a big difference. So, pros, they kind of help manage the understory, especially young trees. I mean, the reality is a mower manages the understory well and very efficiently and sheep do it much less efficiently. But we are getting a little bit of that double functionality by using the sheep, especially in the young trees. It really encourages you to keep them mowed close, which is good for growth in young trees. For the older trees it's nice to be able to go in and just mow rather than have to wait for the sheep to get there in their rotation. We may see that there's benefits to our long-term nutrition program, though we are not seeing them, yet we could see them down the road. There is a little bit of a risk mitigation piece to it. We see a little bit of revenue, though now it is not a cash positive business for us. But, in a year like this when things are tough, we'll take what we can get. As always, it's great to have meat around. The con is time versus revenue. It takes quite a bit of time for us, especially, you know when you have to start splitting flocks up and you have your rams or lambs and you're trying to breed differently. We've got quite a bit of work just setting up fence for us, so that's hard. Even when we make money, it's hard to justify herd size in demand versus the available resources throughout the year. Not all our blocks are the exact same size, forage isn't always ready when it needs to be ready, unlike in a pasture system, that herd forage needs will go up and down. You're also lambing, you're sheering, and you're vaccinating. Sometimes there's things that you have to do with the sheep, and it's just an inopportune time to do it. I just need to note that I'm the farmer, Stacey mostly does the sheep so she would probably be telling a little bit of a different story. You're hearing it from the disgruntled farmers point of view, so I apologize. This idea of conflict between flock and farm, again, a lot of people see our orchard alleyways and they think look at all that grass, look at all that pasture. I've had people come and ask me if they can bale it or if they can graze their cattle in it. People always want to know what we do with all the grass. The reality is it's a road, it's not a pasture, But, having fence in the way, waters in the way, having all sorts of stuff in the way can be challenging. So, that's probably the conflict that I run up against the most. That and the time issue. Also, this idea of dual specialization, and I don't know if anybody else on the call has run up against this, but we grow trees commercially and it's really what we do. We have a lot of investment in the equipment that we need to do it and the skills that we've that we've developed in order to raise trees, and it sometimes just hard to, when you start branching into these things, to build up the equipment and the skill set that it takes to manage them well and do it properly. There's a real cost associated with that. Those are the pros and cons. Our soil analysis, our means of fencing, our pretty pictures, our maps, and our food safety plan are my presentation today. Thank you everybody.

Maggie: Thank you Harrison. Now, I think if we should just open for questions so Jen, Ben, Carolyn do any of you have any questions for Harrison? I guess too Harrison if you have any questions for the farmers participants.

[17:26]

Harrison: My question is about this nutrient management piece. Those are the claims why you want some sort of integrated livestock and I have some friends that do chicken rotations and they just swear by it, but they are a smaller scale, and they are highly diversified chicken. They are diversified veggie farmers, and they do these real high-density chicken moves. They really swear by it. I think the other big thing about chickens is that you're adding feed to the situation. We don't add feed. We're just eating grass and recycling it through these animals. So, I guess that's one of the questions that I have is, do people see real nutrient benefits? To me I don't see it and I don't see how it's necessary, unless we're talking about microbial communities, which may well be making a big impact if that premise of integrating animals. I'm challenged to figure out whether it's worth it or not.

[18:19]

Ben: Yeah, this is Ben. I've got two questions Harrison. You touched on one of them with the microbial communities. Have you taken any PLFA tests to go along with your nutrient testing? The second is why sheep?

[18:37]

Harrison: We have done the ward lab test the past couple of years.

[18:43]

Ben: Is that the Haney, or the PLFA? They do both.

[18:45]

Harrison: The Haney.

[18:47]

Ben: That one is not microbial.

[18:48]

Harrison: No, the Haney is the one that has the microbial test.

[18:53]

Ben: OK, the PLFA in our experience is that one that shows your fungal environment, your bacterial environment, and the Haney would be the one with all the extracts mimicking root exiting enzymes.

[19:06]

Harrison: So, we looked at the one that was advertised as the living soils test, where they dry it down and weigh the number of bacteria and stuff in there. It's probably my fault. I just look at the I look at the tests you know with slack jaw. Without help, it's hard for me to interpret what exactly the tests are saying, and I guess the maybe the other problem too, is that as a young idealist I've thrown, you know all the snake oil I can at these trees, and so you know, we've done lots of inoculants, we've grazed animals, and we've done rot composting sprays. That's part of the problem just throwing everything at a situation. When you do try to get analytical about it, it's hard to tell what worked and what didn't work. Sheep is because they're short. There is somewhat of a global tradition of sheep in horticulture and viticulture situations. They're not as much of browsers as goats. A lot of people say, well, why don't you get goats and goats are heavy-duty browsers. Cows are too big, just straight up. Pigs would maybe be interesting, but I don't think Stacey and I have a real interest in in doing pigs. I think poultry would be the best thing to do it with. But

again, you'd run into that situation of needing to get through the rows regularly with tractors and if you've got chicken coops in the middle of the rows at inopportune moments, then animals are getting in the way. I think that would be the back breaker of the poultry, but I think ultimately the poultry would make poultry might have the best impact. We chose sheep because of the tradition of sheep in orchards and then the physiology of the sheep worked well for the system for the most part.

[21:17]

Jen: Yeah Harrison, on the soil health front, at Rock Bottom Ranch, we started doing soil health studies across our property last year. We have set up control exclusions in a lot of our pastures as well. It's going to be a three to five-year study of seeing if we get the quantifiable differences that we're looking for. That said, from even just our baseline results, our most intensively managed areas with animals were the ones that returned with the healthiest soil profiles and highest organic matter, which is what you would expect. When it comes to what different animals you use, the niche of how the animal is interacting with what you have there and what your goal is matters. Chickens do lay down a fast turnover manure more than sheep and goats would, but I think if you're grazing to manage grass, chickens destroy a lot of what's there, and they can lead to like more real problems. With sheep you're going to get the cleaner graze and support a better biodiverse array of pasture grasses, forage, and legumes. [inaudible] where I also do multispecies systems, both at Glenwood and Stone barns. We saw that the areas that they had run chickens through were starting to get a strong invasion of certain nightshade species and things like that. So, I think it's also this balance, because at a certain point, it's like it throws the nutrient profile off. It was either the phosphorus or the sulfur from the chicken manure that made it into a less desirable area, which made the management want to scale back the chickens or move to a completely different area. So, I think it's hard. I think it's just so nuanced and depends on really what you're managing. Doing the mob grazing really tight and getting as even of a graze and as heavy of a manure load and then moving it on is how you get the fastest results.

[23:43]

Harrison: Yeah, I mean we're real nitrogen hogs. We use a lot of nitrogen. That is why I am inclined to think that poultry is better. You see it when the grass regrows, when you do a great good rotation, the grass and alfalfa that grows back is beautiful. The reality is you don't see the same, at least in short term observations, you don't see the same benefits with the trees. They just have different relationships with the nutrients in the soil than the quicker growing grasses and alfalfa do.

[24:16]

Jen: Yeah, for sure, the tree component is interesting to think about too. Obviously, that isn't something that like I've managed for. So, maybe it would be better with chickens.

[24:25]

Harrison: And like I said, in 15 years, we might really swear by this stuff. At the three-year window, however, it's a much different story.

[24:34]

Ben: I've got a question following up on what Jen mentioned of the mob grazing effects. What's your density of animal to square footage? Are you giving them access to all the alleyways at once? Are they pretty spread out or are they pretty concentrated together?

[24:50]

Harrison: We mostly push them down the alleyways one alley at a time. Ben, I have to guess that we have at any given time about 20 to 30 sheep per eighth of an acre. They are relatively small pastures that we move them through. If we have an opportunity or know that we really don't have time and can't afford to move them a lot the next week, we will try to find them a bigger pasture of around a quarter acre. I'd say anywhere between 20 and 35 sheep per 1/8 to 1/4 of an acre depending and those moves are done anywhere from every other day to once a week if we can find a little larger area.

[25:50]

Ben: Got it, so that's dense. My follow up question is what is your decision-making process about when to rotate? What weight are you giving your needs for being out of the area for your 90 to 120-day harvest versus how much weight are you giving based on the observant queues like short is the grass is? What's our next rotation going to look like regardless of the tree health? How do you weight that move time?

[26:22]

Harrison: That's a tough question. I mean, essentially the 90 days is non-negotiable. We need to do that for compliance with our program. So, I'll tell Stacey a date and I'll say all right you got to be out of the peaches by end of May. She knows no matter how the rotations going, they need to move on by the first of May. Jen, Carolyn, and Ben y'all know if you're ever sitting down to write up food safety plan, I'll sit down with you and go through line by line just to get you started. Anyone else with a current food safety collaborative work are all here to help get that thing going.

[27:12]

Maggie: With that, I just wanted to say thank you all for spending an hour with us today. It was really nice to hear from all of you. I'm really grateful for your participation. That's that!

[27:26]

Everyone: Goodbye, thank you!

[Music]

[27:29]

Outro: Thanks for listening to our Produce Safety Focus Group series. For visuals from the presentations, more information on this series, and other produce safety resources, visit [youngfarmers.org/focusgroups](http://youngfarmers.org/focusgroups). This podcast was edited by Hannah Biel and recorded in partnership with the National Farmers Union Foundation over the summer of 2020 as part of our FSOP produce safety programming.

[Music]

[28:07]

*Transcribed by Mackenzie Jeter, The National Farmers Union*