EPISODE III:
Multifunctional Spaces & Sheep Grazing with Haven Kiers

SARAH BECK
You're listening to Garden Futurist: A show about innovative thinkers contributing to a climate resilient future through the power of gardens. I'm Sarah Beck with Pacific Horticulture, here with Adriana Lopez-Villalobos. Hi Adriana.

ADRIANA LOPEZ-VILLALOBOS
Hi Sarah.

SARAH BECK
It's good to talk to you today. I'm hoping you can tell me something about our topic?

ADRIANA LOPEZ-VILLALOBOS
I'm very excited. Today's podcast is about multi-functional landscapes or "green spaces" and a very particular way of maintaining them involving sheep grazing.

SARAH BECK
Did you just say sheep?

ADRIANA LOPEZ-VILLALOBOS
Yes. Our guest is conducting an experiment looking at all the potential benefits of sheep grazing for the ecology of the soil, its biodiversity, but also its impacts in people's health.

SARAH BECK
Well let's get on with our conversation about sheep with our guest, Haven Kiers. She is an assistant professor of Landscape Architecture at UC Davis.

Hi Haven. So good to see you.

HAVEN KIERS
Hi Sarah. Thank you so much for inviting me. I'm excited to be here.

SARAH BECK
I want to ask you about a multi-part experiment to scientifically study how sheep can maintain landscape on campus. You are a longtime proponent of green infrastructure, such as urban landscapes that are aesthetically pleasing, as well as ecologically productive. You say grazing sheep are a natural outgrowth of that research. Where did you get this idea? Why sheep?

HAVEN KIERS
Well, so it goes back to an article that I read in the New York Times a while ago that talked about sheep grazing in front of the Eiffel Tower in Paris. And there was something about that image of this iconic tower and symbol of Paris and then the sheep performing maintenance in front of it that it stuck with me forever and I've always wanted to replicate it. And then I

started doing some research on sheep and learned that there's a historical precedent here in the US.

You've got Frederick Law Olmsted, he actually designed Central Park. They originally wanted a major meadow to be sort of a military parade ground. But what happened is he wanted something more pastoral and he wanted to create sort of a break from the dense urban city environment.

And so he created what is now known as the sheep meadow and had actual sheep. I think it was a sheep herd of 48, 50 sheep that were out there that grazed the meadow. And it was a combination of performing maintenance for the lawn, but also creating this experience for people to come and feel like they were walking through the countryside and be able to look at that.

And then I learned that during World War I, Woodrow Wilson actually also had sheep and he brought them to the lawns, both in back and in front of the White House. And the idea there was also to reduce the amount of manpower needed because the men were away fighting at war and so sheep could come and do that job.

But they were also using the wool. And so they were able to take the wool from those sheep and auction the wool off. And I read that they raised something like $52,000 for the Red Cross, just through those wool donations.

SARAH BECK
Wow, that's incredible.

HAVEN KIERS
Those images have just stuck in my mind. How can we take something that is productive, that is practical, that does something beneficial, that's also sustainable, but is also this engaged experience that people want to be a part of? That is beautiful for them to look at, that has scientific and sustainable benefits but it's also this spectacle that people want to join and watch and just be?

SARAH BECK
I can't believe that those sheep weren't recognized better in all the propaganda imagery?

HAVEN KIERS
Exactly. Why don't we see those sheep?

SARAH BECK
Rosie the Sheep gave a lot. I'm curious though, about how the sheep improve the ecology of the site.

HAVEN KIERS
So for my experiment, I'm really sticking to a lawnscape, right? It's a campus lawn that is used primarily for events. So it's not one that needs to be regularly maintained because they'll clear it out before events and use it.

And so within this idea of a lawnscape, the big thing that the sheep are doing is reducing weeds. For sheep, weeds are like candy. It's the first thing that they want to eat. It's the first thing that they go for. And so things like bind weed and thistles, even fox tails. If they're green enough and early enough, the sheep love them. Once they start to brown out, not so good, but when they're bright green and wonderful, they want to eat those. They're also adding fertilizer to the site. And so if you think about that and the sheep going around and pooping out what they're eating, that is adding to the quality of the soil.

So a couple of things I'm looking at. First, I'm looking at microbes within the soil and to see if beneficial microbes are increasing. Along with that, I'm looking at soil structure and seeing whether they're compacting the soil or if they're less compacting than, say, a really heavy-duty lawnmower. And then I'm looking at the nutrients within the soil. Are they actually adding nutrients by grazing? And so is that improving, then, the quality of the grass and things like that?

There's another area of beneficial insects. And so again, it's going back to the poop, but there are certain beneficial insects that are attracted to that, that then can provide other beneficial services and help with pollinator services and things like that.

I see this as a very small scale application: homeowners, campuses. But there's a much broader application, too, where you can start thinking about grassland restoration. And if you think about here in California, I mean, grasslands once were all over the state and they're the most endangered areas right now. Again, with the sheep, what they're doing is they're eating the weeds first. So they're going and they're eating the weeds and they're reducing that invasive weed pressure, opening up spaces for the native grassland species to actually come up. So that's a huge thing in terms of restoration.

Right now we're about to go into a drought, we're about to start another fire season. The sheep are really good at eating down that fuel. And so any of the fuel that's building up, we're talking about potentially using them on the edges of campus. It's a smaller version of that wild-urban interface, but those areas where you don't have lawnmowers all the time and you don't have the constant pressure, those start to get thick and full of vegetation. The sheep will go in. They'll clear that out. So you can actually reduce the likelihood of wildfire.

They're also really good with helping establish new trees, and so thinking, yeah, this is a new one for me, where if you're putting in new trees and seedlings in there, the sheep aren't interested in the trees. And so they'll actually eat all of the weeds around the new saplings. Again, clearing out that area.

SARAH BECK
That's reducing that pressure. Yeah.

HAVEN KIERS
Reducing the pressure**.** So there are just a lot of applications that are good for the environment and also really fun to watch.

[Break for Underwriting]

SARAH BECK
So I want to ask you, because the pilot project addresses the question of how can science design and practice converge to inform the creation of accessible, multifunctional green spaces, this is quite a mouthful, that maximize cultural and environmental values. That's a lot of things. Can you help break down these ideas? Is this part of your Nature HEALS concept?

HAVEN KIERS
In fact it is. And so Nature HEALS is a concept that I came up with to describe very broadly the kind of landscapes that I'm interested in and HEALS stands for health, engagement, aesthetics, landscapes, and sustainability.

And so broadly, what I'm really interested in, yes, there's very much this like sheep versus lawnmowers, right? We can look at that and we can look at the environmental impacts. But it's more about creating multifunctional landscapes.

For me it really is, how much can we package into one landscape? Landscape architect. We want something to be beautiful. Make something that tugs at heartstrings, that people want to see. But then there's also the side of science and how can we learn from these landscapes and how can we get data and how can we figure out like, what insects are visiting? What are the plants that are growing? And really promote sustainability, but not in a way where we're trying to shove it down people's throats. I feel like there are these two camps of landscapes either have to be beautiful or they have to be good for you. And so it's like, how do we merge that?

But then how do we do that in a way that is the two other aspects, one, manageable, right? It's something that can be maintained. It's something that highlights the practical aspects, right? Bringing in sheep to do this, or thinking about maintenance, which is something that typically gets hidden under the rug and designers come in and they do their beautiful landscapes. They walk away and just hope to god that someone knows what they're doing in terms of maintaining them. But then I think the most important part is that engagement factor. And how is it that you can bring people to landscapes and really make them feel like they're part of it?

And so that's where this Nature HEALS comes from because it's like, bring people outside. We know all about the healing power of nature. We know that it makes people less stressed, happier about themselves. So let's capitalize on that with these landscapes that have all of these different layers in them so that people want to be out there.

SARAH BECK
So there's this connection with physical and psychological health as well, connected to the beauty.

HAVEN KIERS
Exactly. We've seen so many studies that talk about how just looking at nature, looking at green space, looking at a wall versus a tree when you're sick, helps improve the amount of time it takes for you to recover. We know all about this. And we talk about it a lot, but how do we actually employ it? And how do we make spaces, especially on a campus, right?

SARAH BECK
So you just mentioned also the operational viability. Do you feel like this project is starting to show some promise in that way?

HAVEN KIERS
Yeah. I mean, so I need to be perfectly clear from the outset. The sheep are not replacing the grounds crews. They will never replace the lawnmower. That is not what I want them to do.

SARAH BECK
You're not stealing jobs right now.

HAVEN KIERS
No jobs stealing, no unionizing for the sheep. Really, what it's doing is it's opening up space for the people in grounds and landscaping services to do other things, to work on more specialized applications on campus and to give them another option of how to get some of these spaces.

So like I was talking about that event lawn. It's not necessarily something that is in the regular rotation of mowing. It needs to be mowed before an event. You need to think about it at certain times, but it's not an everyday thing.

Spaces like the area between vines in a vineyard. This is another perfect area for sheep. Where, for grounds, it's an extra amount of labor getting in between those rows, turning around, getting to the next, it's not something that you can do on a large riding mower. Thinking about in between solar farms. Same thing of those rows.

SARAH BECK
There are other examples of your interest in how design helps redefine urban landscapes as multifunctional spaces. Could you share some of the other exciting frontiers of green infrastructure that you think will have similar multi-dimensional benefits?

HAVEN KIERS
I started studying green roofs back when I was in graduate school, when people told me, ironically, actually, that you couldn't have them because they were so hard to maintain and you needed to have a sheep on the roof in order to maintain them.

So, see, it all comes back. It all like, weaves its way back together again. So green roofs and sheep. But so now being out here in California, where green roofs, people tend to see them as problematic because of irrigation issues. And because they are, like, retrofits are expensive. A lot of our existing buildings cannot take the weight of a green roof.

I focus all my energy into these small-scale green roofs. And so through classes that I've taught, through sort of personal things, I have created green roofs on dog houses, on chicken coops. I've done it on a bike rack, like a bike enclosure. On the same trip when I was in France and I visited the Netherlands, this is what I began to see. Everywhere, were these little, small-scale green roofs on top of garbage enclosures or on top of bike racks. Literally everywhere I went. It was like, children's playhouse and it had a green roof. And they were integrated in parks.

So those are the things that I'm looking at. I am looking at biodiversity in terms of lots of different plants and little nooks and niches, right? So if I can put them on those dog houses, on bus stops, in the little cracks that are around street trees. So a combination, wherever I can get those plants, however I can add them on to infrastructure, that's what I want to do in any way possible.

And then the other thing that I'm really interested in is the idea, again, goes back to the sheep and these multifunctional landscapes, is the idea of the spectacle, of celebrating the green infrastructure, of celebrating the moment.

And so as we enter into what looks to be another horrible drought, I want things to celebrate rain. And so we have these rain barrels, right? And people collect rain. Rain barrels are the ugliest things I've ever seen. They're like those blue vegetable, like, oil containers. And they're just so ugly. So what I want is not just like, okay, how can we design a better rain barrel, but how can we create installations that really celebrate when it rains?

So one of the classes here at Davis that I teach is a design build class and we're allowed to play in our courtyard and build all sorts of different things. And one of the first projects that we did was to build an overhead runnel where we're capturing stormwater runoff from the neighboring roof and then sending it in this runnel that goes overhead over a path, comes

down a rain chain and then is exited into a rain garden. And you can hear the water as it's going over your head, you can watch it as it goes down the rain chain, you can see it move through to the rain garden. And it becomes this moment where you're like, oh my god, it's raining. I need to go watch this.

And that's what I want to do. So that it becomes this idea that it's raining, let's go into the landscape. Let's go see that. And if we can bring those into cities, if we can bring them on to campuses, then it's highlighting part of this maintenance thing. It's highlighting the need to keep the plants alive to do these things.

Our system, our engineered system of pipes and drains, like, wow, great for engineers for designing them the way they did so efficiently, but they are so hidden. And so it means that we don't talk about it and we don't think about it. And the water that overflows on our yards when we water overhead goes into these drains and we don't even have to see it.

I don't want to beat people over the head and say, you must conserve all of your water in a bucket, and this is the way to do it. I want them to do it because they want to see that water go down the runnel and they want to see the rain chain and celebrate it.

And those are the kinds of landscapes that, again, bring in all of those aspects of aesthetics, sustainability, but then functionality and practicality.

SARAH BECK
Nice. Well, this was such a fantastic conversation. Haven, thank you so much for sharing your multi-dimensional resilient landscape futurist vision. It's really incredible.

HAVEN KIERS
Thank you for inviting me. This is such a treat.

SARAH BECK
Wow, Adriana, I really enjoyed that conversation. I thought that Haven's perspective on just how she is so celebratory of these multiple benefits of the landscape, it was just really fun to listen to her. Could you tell me what you found most interesting?

ADRIANA LOPEZ-VILLALOBOS
I really liked the NATURE HEALS concept as an integrative approach for looking at landscape design, considering biodiversity, sustainability, and people. The other thing that I found really interesting is the merging the “beautiful landscape” with “the ecological beneficial landscape” without considering the maintenance aspect, which is something that, as she mentions, is often ignored in the design stage of the project. And I think she does a really good job at putting all those concepts together.

SARAH BECK

I totally agree. I think that maintenance aspect is quite critical although it's not always the sexy part of landscape architecture conversations but it really is so critical. This project was also perhaps deceptive, because as first it seemed to be very specific as a project, and then I feel like it became very obvious how the broad the applications of this concept were. And how she fits this into her bigger framework of her interest every landscape having this, these multi-dimensional qualities, I thought that was very cool.

ADRIANA LOPEZ-VILLALOBOS
Yeah, that actually brings me to the next point that I have. I think it's worth highlighting the scale component and the applicability of the results of the experiment itself. On one hand, there seemed to be an immediate use in smaller urban landscapes, but on the other hand, the applicability on larger scale projects for wild landscapes – like what she mentions about sheep grazing for grassland restoration and tree planting projects and its effects on wildfire-prone landscapes. I am excited about this project and look forward to hearing more about its outcomes.

SARAH BECK
And before I go out and look for a place to relax with some sheep, I'm going to say thanks to everyone for listening today.