

## **PLANT PEOPLE Season Two Episode Five ‘Moving Past Peat’ Transcript**

**JENNIFER BERNSTEIN NARRATION:** It feels like we’re never closer to nature than when we’re working with soil. As kids, playing in the dirt was pure joy, simple and carefree. As adults, we get our hands dirty planting gardens and potting houseplants, bringing more greenery into our lives at a time when we all need it. But even when it comes to soil, sustainability is a big concern—and we can all do better.

This is Plant People from NYBG. I’m your host Jennifer Bernstein, CEO & The William C. Steere Sr. President at the New York Botanical Garden.

In this episode, my guests are Chad Massura, founder of Rosy Soil and Kurt Morrell, the AP Farm Vice President of Horticulture Operations at NYBG. Today we’ll learn about peat. What is it and how is it connected to the soil that we use in our everyday lives? Chad and Kurt will walk us through the environmental consequences of peat harvesting and how peat-free soil is changing the game for gardeners and the environment.

**JENNIFER BERNSTEIN:** So we're joined by two wonderful guests today. Kurt, you're one of our staff members here at NYBG. Can you explain what you do?

**KURT MORRELL:** I am Kurt Morrell, I'm the AP Farm Associate Vice President for Horticulture Operations. I am in charge of the grounds and the arboretum and the plant health department at the Garden as well as the operational ends of our glasshouses.

**JENNIFER:** Wonderful. And Chad?

**CHAD MASSURA:** Yeah great to be here, thanks for having me. My name is Chad Massura. I'm the founder and CEO of Rosy Soil. And we're an organic, sustainable potting soil that uses biochar instead of peat.

**JENNIFER:** I think many people in our audience are going to be familiar with peat, but I think it's a bigger story. So let's start out with the basics. What is peat? And how do you define peat-free soil?

**CHAD:** So, peat or peat moss as people have probably seen it on the bag of soil that they recently purchased, it's been really used since the sixties in horticulture. So it became super popular then. And it's been basically the main ingredient in potting soils and container soils really since then. I guess the challenge is that peat is harvested from peat bogs, which are really important ecosystems that house wonderful plant and animal species and are also storehouses for carbon.

So, kind of crazy statistic is that 3 percent of the earth's landmass are peat bogs, but they hold about 20 percent of the Earth's stored carbon. They actually hold more carbon than the Earth's forests. And when we extract these really important ecosystems to make things like peat moss, we release a lot of that stored CO<sub>2</sub>.

**JENNIFER:** Yeah, that's fascinating. I think many people have heard of cranberry bogs, maybe, but peat bogs may be new to folks. So, is it like that? It's a sort of wet environment?

**CHAD:** Yeah, it's a wetland basically. It's a wetland ecosystem and there's some important characteristics that allow it to store carbon. Because basically over thousands of years, it takes plant material and instead of it decomposing and releasing its carbon, it basically gets stored in the bog.

**JENNIFER:** Yeah. So, Kurt, why have people been using peat?

**KURT:** It's readily available. Our neighboring country has 300 million acres of peat bogs.

**JENNIFER:** This is Canada?

**KURT:** Canada, and they've been harvesting it since the beginning. It was used in the horticultural industry, and then, literally we have been using it from everything

from top dressing a lawn to growing our organic vegetables to using it in our soil mixes.

**JENNIFER:** And why has it been a popular ingredient... and what are the benefits of peat? Why do people want it in the soil?

**KURT:** Peat is a, it's a very neutral matter. So it absorbs moisture. It releases moisture. It is nutrient-free. So growers are able to control what nutrients are growing into their production. It's very light from a transportation standpoint. And, they felt there was an abundance of it. Over 300 million acres and they're harvesting, I think it's like 50,000 acres, but whereas, England, for example, they've had a peat ban now that it started in 2024, and by 2030, I believe, they're not even going to be using it in the horticulture because their bogs have run dry.

**JENNIFER:** Yeah. So, Chad, I'm sure that when you were starting Rosy Soil, you did the kind of market research to understand what it was that people were looking for in a soil amendment. What are the things that you heard from consumers about why they like peat? And what did that tell you about how to develop a peat alternative?

**CHAD:** Yeah, and maybe it's helpful to just zoom out for a second and tell people why a potting soil itself is important. Basically we're trying to mimic the environment that these plants evolve to be in.

And so, you need something that quite simply holds the root system, something that holds water well. Something that importantly holds oxygen well in the mix, because roots need a balance between basically being wet and dry. As Kurt mentioned, you basically want some level of nutrient cycling so that nutrients can get to the roots.

And so, over the course of the last 50 years or so, we've just gotten really used to the way that peat performs. In my opinion, I actually don't think it's that great of a container medium for a couple of reasons. But I think we started using it because it was cheap and plentiful, and now we've sort of gotten used to the way that it works in a potting medium.

**JENNIFER:** Kurt, you talked a little bit, about the peat ban in England. Why is it that people are concerned about using peat these days?

**KURT:** Well, taking Europe for example, by their harvesting, we've released all the sequestered carbon. So these peat bogs, like I said, took 10-12,000 years to form. Now we're trying to reverse those effects. Recent research has shown that the bogs can be restored back to a net-neutral after 20 years.

**JENNIFER:** But net-neutral is not sequestering carbon.

**KURT:** Exactly! We've done a tremendous amount of damage. Research is showing in order for us to become a net-zero society, the peat bogs need to play an essential part in this. As Chad said, they're responsible for sequestering over 20 percent of our carbon.

**JENNIFER:** And Chad, what are you hearing? Do you think that there's a growing awareness out there about the harm of harvesting from peat bogs, and is there a growing demand for alternatives?

**CHAD:** I think there definitely is. I mean, it's still, I would say it's still a surprising fact to most gardeners. It certainly was to me when I heard about the issues with peat.

**JENNIFER:** How did you hear about the issues?

**CHAD:** I grew up buying peat. So I, I'm a part of this whole thing, along with most people, I had no idea with the issues. I think as a gardener, you just assume that your hobby is super sustainable cause it's kind of...

**JENNIFER:** You're growing things.

**CHAD:** Yeah, exactly. You're creating life. But I basically just got totally obsessed with climate change and sustainability. And in sort of going down that rabbit hole, I discovered this really important input called biochar, but also the fact that biochar

could be a peat replacement. And in reading about that, I said, well, why would we want to replace peat? What's the problem with peat? And that sort of sent me down this whole kind of journey to discover some of the issues with harvesting it.

**JENNIFER:** It was through gardening. We can learn wonderful things about the world through gardening, I think. And am I right that you first started working up your own char mixtures in your kitchen, in your small New York City apartment? Is that right?

**CHAD:** Yeah basically, within like pieces of Tupperware basically, to try to figure out how to first for me personally, just move off of peat, and then to try to figure out how to make, other inputs and basically create a media that performs like peat; actually performs better than peat with a much lower environmental footprint. And it started, kind of hilariously small and in my kitchen is now spiraled into, we employ a full time researcher, we run our own soil lab. But yeah, it started really, really simple in my kitchen.

**JENNIFER:** Yeah, you gotta start somewhere. So, we've talked a lot about what peat is and why we want to avoid it. What is char?

**CHAD:** So, biochar is upcycled plant material. It looks a lot like charcoal, but it's created in a, basically an oxygen-poor environment. So instead of taking, say wood waste, lighting it on fire and releasing all of that plant's stored carbon, if you can heat that material in the absence of oxygen, you essentially fix the carbon in the material. Which is a lot of fancy words, but it's basically this dark, rich, black charcoal-like substance that's almost pure carbon, and it's a wonderful soil amendment because of the characteristics of high-carbon soil.

So, it holds water well; it holds nutrients well; it acts as a storehouse for microbes. So it creates this really wonderful microbial biodiversity, which allows you to be kind of a lazier gardener and let the microbes do the work. And then when you compare it to peat, because you've essentially fixed carbon in that material, it has a much lower and in fact, net-negative carbon footprint.

**JENNIFER:** Kurt, do we use char here at NYBG?

**KURT:** We've been using biochar in the restoration of a lot of our historical landscape out on the grounds. For about eight to ten years, I've been fooling with it on a lower, smaller scale.

And we've been using biochar in a lot of our ornamental plantings, seasonal plantings throughout the grounds, all the containers, for the last four years.

**JENNIFER:** It would be great for the audience to hear a little bit about the operations, the sort of behind the scenes operations that you run here at NYBG, the Green Materials Recycling Center, which is an amazing place that is behind the scenes, but it's really, really cool. Do you want to talk about that?

**KURT:** The things that are behind the closed doors that nobody ever gets to see; it's all the exciting stuff where all the big equipment is. We do all of our own recycling here. So no green waste leaves this site. And we try to reuse all of our green waste then back on site. So I produce about 1,500 yards of compost a year. Several thousand yards of organic wood mulch that then is used to spread around all of our tree collections; as well as an array of different potting soils and potting mediums that are used in our exhibition houses to our container mixes. And, we're hoping to eventually spread that into our glass house production with more of the use of biochar in there so we could get away from our peat moss mixes.

**JENNIFER:** I remember when we first talked, the three of us, you all were having a lively debate about the right percentage of, was it the percentage of char?

**KURT:** The percentage of biochar is very impressed that some of Chad's mixes have gone as high as 50%. And, he's doing that by composting the biochar, with the compost in the very beginning of the process. And that makes it much more stable. So it was very educational for me. I've been doing this for 37 years and I'm learning every day.

**CHAD:** And the science is still super early on this stuff. And, I think trying to figure out what is the right percentage of char, what's the right type of char, for whatever the application is. So, we've really, I think, pushed the boundary because

we're so focused on trying to create a super sustainable mix, but I also tell people, even at low percent at 5 percent or 10 percent char, you start to really see the benefits of that microbial activity of that water retention.

**KURT:** I think it's always an interesting story of how biochar was found.

**CHAD:** Yeah, it's crazy. I mean, as old as kind of human agriculture is, we kind of figured out this phenomenon where if you put material that hasn't gotten to the point of getting to ash, basically if you burn it and then stop it, before it gets to the ash point and add that to soils, it adds a bunch of richness. And so, in the Amazon basin, there's 2000-plus-year-old soils. It's some of the richest soil in the region. And it is a high percentage of biochar because ancient farmers figured this out a long, long time ago. And so in a way we're kind of just borrowing these processes.

**KURT:** Yeah, we're just borrowing this technology that somebody discovered, probably started to get in our industry in the early- to mid-nineties. You started to read a little bit about it. And then, some of the researchers started to really look into it in the mid-two thousands.

**CHAD:** Like I said, humans have been making biochar for thousands of years, but only recently did we discover that this process is net-carbon-negative. So now there's been a lot of excitement from the climate community to try to figure out how to make biochar more useful in a myriad of applications, including agriculture.

So I think that is part of this, I would say more recent push into figuring out, you know, this is such an important technology in the path to global net-zero. How do we get it to work for various industries like the horticulture industry?

**KURT:** In the arboriculture history, it was really looked at for trying to reverse some of the, uh, environmental impacts on trees. And that's where some of the research originally had started.

**JENNIFER:** Like what kinds of impacts?

**KURT:** Pollution. I mean, heavy metals; tree stress from environmental impacts has lessened the health of our mature trees, street trees in particular. And so a lot of the biochar research was done in improving the overall health. So, some companies have gone to the point of, actually injecting it, making it water soluble. And injecting it into existing conditions and rule of thumb has always been about seven to nine percent biochar is acceptable. That's why when talking to Chad and going as high as 50 percent, it was very intriguing.

**CHAD:** He kind of looked at me like I was crazy, though.

**KURT:** Yes, to be quite honest. Yes.

**JENNIFER:** Well, is it working?

**CHAD:** It is working through complete trial and error. At this point, we have done thousands of plant trials. We've killed hundreds of plants, hopefully so our customers don't have to; but what we try to do is we basically pit plant performance against CO2 footprint of the end material or the end product. And what we have found is the higher you go with biochar, you get performance benefits and you also get those sequestration benefits.

**JENNIFER NARRATION:** When we return, we'll learn more about the damage harvesting peat moss does to the environment, and what could happen if we don't embrace alternatives to peat-based soils.

[BREAK]

**JENNIFER NARRATION:** This is Plant People from NYBG. I'm Jennifer Bernstein. I've been speaking with Chad Massura, founder of Rosy Soil and Kurt Morrell, VP of Horticulture Operations at NYBG about peat, its environmental impact, and the sustainable alternatives we can use to support a healthier ecosystem.

**JENNIFER:** So it sounds like there's lots of benefits and it's fascinating to hear that it's borrowing an ancient technology. I think we're finding that a lot in



regenerative agriculture. We have researchers here that are looking at indigenous agricultural methods and the climate and resilience benefits that they may confer. So there's a lot of relearning things that we've, that we've lost. But are there any drawbacks or are there reasons that people might hold out and still want to prefer the peat?

**KURT:** I think what's going to happen is as a society, we are turning to more organic fertilizers. Organic fertilizers need mineral soils in order to feed the plants. Whereas peat-based soil, you use an inorganic fertilizer and feed the plant that way. So this is going to the philosophy of feed the soil, soil will feed the plant. Whereas using peat-based, we are feeding the plant. So I think it's gonna take a little time for, as a society, for us to change our practices and then accept compost-based mixes.

**CHAD:** Yeah. And as with any industry, there's just inertia. So that's a part of it is people are super used to how peat performs and, I think the other challenge with peat historically is it is, it's just cheap, we're just going and harvesting this, we're pulling it out of the ground. And, so there's just a cost basis that biochar has to compete with. Historically biochar has been really expensive, but what's cool is we're on this cost curve as people are realizing they're starting to learn how to produce it at scale and more cheaply.

**JENNIFER:** So you're raising this demand dynamic. Are you seeing consumer demand shift, and what's driving that? Is it the benefits of alternatives to peat, or is it the concern about the environment? What, what are the drivers that you're seeing?

**CHAD:** It's kind of an all-of-the-above answer, but at the end of the day, it has to work and it has to work better for people to want to use it. You need happy, healthy plants. And I think when you compare the benefits of char to the benefits of peat, people, as soon as they open the bag and plant with it, they get just totally obsessed with how different and how much better this performs.

**JENNIFER:** That makes sense. Kurt, what are you hearing in the horticulture industry?

**KURT:** People want to see a dark, rich soil when they open a bag, whether it's a consumer or a professional. And when you open up a compost biochar-based soil, it's nice, dark, and rich. I think also in our industry, we are all driving to create the more sustainable landscape in every operation; whether it's equipment-based or material-based, and compost and biochar are going to play an essential role in us completing that mission.

**JENNIFER:** You've talked about the importance of preserving these carbon sinks, the peat bogs. What happens if we don't, if we keep harvesting?

**CHAD:** Yeah, we kill the bog basically. That's what happened in the UK. It's what's happened in Ireland. It's what's happened in Scotland. I went and personally walked between a bog that had been conserved and kept alive and one right next to it that had been totally industrially harvested. And the one on the left looks like a wasteland.

It looked like a different planet basically, because we had just killed everything in sight. And the answer to your question is that that is the status quo. That is what's happening. Peatland extraction and peatland destruction currently accounts for 5 percent of total global emissions. It's like two times worse than the airline industry.

So we're on the path towards what you're asking for. And now we need to find solutions to leave these important ecosystems alone.

**JENNIFER:** What's it like to be in a peat bog?

**CHAD:** It's awesome.

**JENNIFER:** How?

**CHAD:** You're just sort of surrounded by life. So there's a bunch of plant species, the most probably famous of which is the Venus flytrap, but there are all these really unique plant systems that can only basically live in peat bogs. And then

there's some really interesting salamander species and bird species that all evolved to live in these really kind of interesting ecosystems.

**JENNIFER:** Yeah, my family, everywhere we go, we go to the botanical garden, but that might not be as much of a trek as going to the peat bog. Kurt, I have a question for you. I think this is one of the, I know that this is one of the sustainable gardening measures that we take, which is the use of a fish-based compost, and it makes the garden smell like fish.

And so I think this is a good moment for you to explain why we do that, because Todd, our head of horticulture, of course, always says, 'Ah, the smell of a healthy garden'. And I think to myself, I guess so.

**KURT:** Yes, our nutrient program here at the garden is based on organic products. Fish emulsion is one of the key ingredients along with kelp. So yes, I do get accused of making the garden smell like low tide at Orchard Beach. I apologize and everybody knows when I'm out there. But, the mineral content of the fish fertilizers helps build soils. There's actually been a lot of research, with using fish emulsion in reducing certain diseases. Kelps, for example, have certain properties in them that will stimulate natural plant defenses. And our whole plant health care program is, uh...

**JENNIFER:** Helping the plants help themselves.

**KURT:** Helping the plants help themselves, stimulating that natural defenses. So all of the products we use in our fertility program are geared towards nurturing that plant defense system.

**JENNIFER:** So what kind of changes can the home gardener make? So, you're Chad marketing to the home gardener and Kurt, I think a lot of home gardeners come here to NYBG to get inspiration for what they might do. What kind of tips would you give to someone who wants to make positive changes within their home landscape?

**KURT:** Start from the basics. I have a saying, dig a \$100 hole for a \$10 tree. Prepare your planting beds. Use good organic soil. Use good grass seed. Use good quality plants. Select the right plant for the right spot. Don't try to force something to grow where it doesn't want to grow. Cause, a healthy plant is a happy plant. And then a happy plant uses less resources.

**JENNIFER:** That's very good advice.

**CHAD:** Yeah, I think I'd add to that. Obviously I'm biased, but I will say, try to go peat-free where you can. And there are certainly a lot more peat-free options at local garden centers, which is awesome to see.

And then, pollinator friendly stuff has been an interesting trend I've seen in the garden community as well, where you try to sort of build an ecosystem that promotes pollinator health.

**KURT:** I literally just came back from a conference this week and a large part of the conference was discussing about pollinators and how we have as a society, just from our actions, whether it's leaving your light on outside, there's, I don't know, 3,000 different species of moths that are responsible for pollinating and these moths do not like light and, we are killing our pollinators.

And I think, we as a society need to be conscious of that. Honeybees only pollinate, I think it's like 3-4 percent of our pollination is done by honeybees. A large percent of it is done by bees and by moths.

**JENNIFER:** Yeah, 'save yeah save the moths' hasn't really caught on in the same way that 'save the bees' has.

**CHAD:** It doesn't have the same ring to it, does it?

**KURT:** And it really hit home with me this week about how important the moth population is and how detrimental it is to having lights on.

**JENNIFER:** Yeah. So, Kurt, what resources would you point people to who want to learn more about how to garden the way that you do? I'm not sure that anyone can garden the way you do, Kurt, but what would you suggest?

**CHAD:** I got to see the greenhouses, I can totally attest to that.

**KURT:** I do feel a lot of the universities are starting to push more of a organic compost, biochar, front. So any of your [agriculture] colleges. In our area, we have Rutgers, we have Cornell, we have URI, Farmingdale. So a lot of their public programs are gearing towards compost-, biochar-related sustainable efforts.

So, I think that is a good thing. Public gardening programs that we offer here at the garden are a great way to educate the homeowner.

**JENNIFER:** You teach in our continuing education program.

**KURT:** I do teach in our continuing education program. In the past I have taught turf and grounds management. I have taught sustainable horticulture program here. We have a one-week intensive. So those are always great ways to learn new techniques.

**JENNIFER:** How much turf are you managing here at the garden?

**KURT:** The Garden itself is 250 acres and we have about 75 acres of turf.

**JENNIFER:** It's funny, I think sometimes turf – because people are excited about the potential of native plants and adding in biodiversity – turf, which is a sort of monoculture, can get a bad rap. But in a public garden environment, turf plays a very important role. First of all, it's efficient to be able to manage and it allows for recreation so people can sit on a lawn and enjoy themselves.

**KURT:** I've always said the turf is the framework to our art.

**JENNIFER:** That's right. You know, we have gardens that are framed by the turf. So the turf doesn't need to go away entirely and it can be a reservoir for biodiversity and, and for carbon sequestration in a way that it hasn't been.

So, you know, at the homeowner level, maybe you want to start to reduce your turf. Even here, I think we will over time reduce our turf, but there's always going to be a role for these things. They just need to change, don't they?

**KURT:** Yes, that's, I agree a hundred percent. I, these big vast lawns and these big vast estates, if we all start to reduce by 50 percent, will do wonders for our pollinators and wonders for the environment.

**JENNIFER:** Yeah, it's very exciting, to see the energy within the gardening community about how to make these kinds of changes. You must find it really gratifying, Chad, to talk to people who are using your product and then also, becoming more educated about the impact of all of their actions. And I bet it leads to other kinds of changes. Are you seeing that?

**CHAD:** Yeah, I mean, it's such a fun process and I think gardening as a hobby is such a sort of lifelong journey. You know, I think every season you get some things right and you get some things wrong and you try to figure out what happened and you learn a little bit.

So it's been, I mean, one of my favorite aspects: I get to answer all the really fun, interesting, sometimes quirky plant questions people have. But it is, you know, if you can just do a couple things right or just give one nugget about how a root system absorbs nutrients or why the soil-food web matters, you can start to just see, you know, different ideas, unlocking people's heads and see them evolve into becoming a better gardener.

**JENNIFER:** But it is true that we were your first customer, right, here at NYBG?

**CHAD:** You were the first, I looked at it July 1st, 2022. Which was a month after we launched the brand. Yeah, we launched here at the gift shop. So you guys have been a supporter since the beginning.

**JENNIFER:** That's a cool origin story, I think. I'm biased, of course.

**CHAD:** Yeah, I'm biased as well, but because I live here in New York, so it was awesome.

**JENNIFER:** So you're on the podcast Plant People. And one of the questions I like to ask is why are you a plant person? So Chad, why are you a plant person?

**CHAD:** Yeah, so I grew up gardening. I lived with my grandma in Chicago and she was a big gardener herself in our tiny, I would say like 10x10 city lot. She just made it just overflow with life.

And I was a soil nerd from a very young age. I think I asked for potting soil for Christmas when I was three years old and got a giant pile of admittedly peat-based potting soil under the Christmas tree. So I was perhaps kind of destined to start this company.

**JENNIFER:** Wonderful. Kurt?

**KURT:** I have been working in the green industry since probably as soon as I could walk. I had the neighborhood wrapped up cutting the lawns for \$2 apiece and wanted a quarter raise. But yeah, I was the kid that was cutting everybody's lawn in the neighborhood.

My father was a caretaker for some big estates. So I grew up in the industry and came here on a high school field trip and then ended up going to college here for two years and, I have been here ever since.

**JENNIFER:** So You were both destined to be plant people. That's wonderful. Okay, well thank you both so much for being here. It's been wonderful talking to you and I look forward to seeing you both in the Garden and what you do.

**JENNIFER NARRATION:** You don't have to be a soil nerd – although we welcome it if you are – to be curious about what's happening beneath your feet.

Digging your hands into the dirt can and should still bring that pure joy, especially if you are gardening in a more intentional, planet-friendly way.

Join us for our next episode as we sit down with Dr. Ana Maria Bedoya, Assistant Curator at the Center for Biodiversity and Evolution here at NYBG. She calls her work ‘extreme botany’; she studies aquatic plants living in river rapids and you won’t believe the extreme methods she has to use to do it.

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