

## **Plant People Season Three Episode Eight “Giant Water Lilies with Brie Langley & Vanessa Callahan” Transcript**

**JENNIFER BERNSTEIN NARRATION:** If you've spent any time on the botanical side of Instagram in the last few years, you likely spotted NYBG staff waist deep in a pool of water, stacking weights, sandbags, and other objects onto lily pads the size of a tire. The Water Lily Weigh-Off, which marked its third annual event in 2025, has grown into an international phenomenon with botanical gardens, museums, and zoos, the world over facing off to see whose giant water lilies can hold the most weight before sinking.

I'm Jennifer Bernstein, CEO, and the William C. Steere, Sr. President at the New York Botanical Garden, and today, I'm joined by the originator of the Water Lily Weigh-Off and one of its fiercest competitors. Vanessa Callahan of Denver Botanic Gardens and Brie Langley of Royal Botanic Gardens, Kew, who are here to talk about all things water lilies.

From their unique plant structure, which allows them to hold well over 100 pounds in some cases, to the gargantuan size that South American species like *Victoria amazonica* can reach.

**JENNIFER BERNSTEIN:** Vanessa, Brie, welcome. Thank you so much for joining us. I'm thrilled that you're here to talk about all things water lilies. Vanessa, we're going to start with you since this idea originated with you in the Denver Botanic Gardens. How did the Water Lily Weigh-Off begin? What sparked the idea?

**VANESSA CALLAHAN:** When I started making videos for the internet, I had no idea what I was doing, and I needed new ideas constantly, so I was always trying to source ideas. And a volunteer suggested I do it. So, I reached out to our horticulture team and our aquatics horticulturalist. So, I was like, “Well, am I allowed to do it knowing that I might sink or damage your leaf?” And she said, “Yeah, well, let's wait till the end of the season and when we're about to pull them, so it doesn't matter.” And it was really surprising. I started taking bets internally and it was surprising how much weight it held in October. So, a few years later, we

were looking for ideas again. I was like, “Hey, that was a good one.” So, I was like, “Let's get other gardens that always are going to have bigger water lilies involved. See who you can reach out to to try and participate with us.”

**JENNIFER:** Well, it has certainly grown from there. It has become a global phenomenon. How many gardens were involved last year?

**VANESSA:** 48 is the official count, but then there was a lot of also unofficial entries, which we welcome.

**JENNIFER:** Well, it's definitely grown and it's gotten a lot of attention, which I think from my perspective, anything that's bringing attention to the wonderful work of horticulturists at botanical gardens is great. What do you think has sparked that attention? What do you think has generated such interest from the public?

**VANESSA:** It's a couple of aspects. People come to the gardens and say, “Oh, I saw that leaf. First of all, I've never seen the underside of that leaf.” And it is a really striking difference between the upper side and the underside. So, it's a little glimpse behind the scenes that you don't normally see, and it's pretty gnarly and cool to look at. So, I think that helps. The plant itself has a few hidden secrets and it's huge. And then, the creativity and competition of all of these gardens participating and really leaning in to social media and having fun and showing off their personality in creative, fun, and playful ways, I think has really led to the enormous boom we saw this past year in 2025.

**JENNIFER:** Well, and we try to get an in on the mix, of course, and I have to do a shout out for our wonderful Horticulture team here at NYBG. Mark Hachadourian, Zach Liebovitch. There's a whole group of people that grow the water lilies throughout the season, and then apply a lot of creativity alongside their colleagues in the Marketing team to putting together videos that will attract public attention. So, I know from our vantage that there's a lot of creativity that goes into that, and I think it's part of the story. Let's talk a little bit about the plants themselves, and I'd like to hear from both of you and maybe starting with you, Brie. Can you talk a little bit about the way that they behave in their native ecosystems?

**BRIE LANGLEY:** The way that we tend to grow them in botanic gardens as annuals from seed tends to be how they would grow in the wild. A lot of the time they would be annuals, even though they can live for, I think it's been documented up to seven years, tubers. Most of the time they'll be growing as annuals simply because of fluctuations within the riverbed and their environment. So, they've got to change and grow really quickly and make use of that.

**JENNIFER:** So, these plants grow in the Amazon throughout South America, in lakes and rivers. So, let's talk about some of the adaptations that they've developed based on where they're from that are unique.

**VANESSA:** Yeah, they've got these big gnarly spines. That's the first thing to know if you're going to handle them. They can be a little dangerous. Those spines will go through anything. Gloves, jeans...they're incredibly strong and because they're growing on the surface, they can just grow right over other plants and rip them to shreds underneath them.

So, it's really hard to, for a plant to try and compete with that kind of plant. Plants aren't usually used to like direct physical violence from other plants in that way. And then of course the network of veins that really helps them stay afloat is incredibly impressive.

**JENNIFER:** So Brie, Vanessa mentioned the structure of these plants. Can you talk a little bit about that structure?

**BRIE:** Well, the leaves themselves, the leaves are the most interesting when it comes to their structure. So, when they first erupt from this kind of like growth center, which kind of looks a little bit like beige cabbage underground, it comes out as what I would term as a green hedgehog.

Basically it's like a fist-shaped green spiky blob, and it whirls around like a medieval mace, like a weapon, and it clears the surface of all of the plants and then it slowly expands out. I did a very, very minimal study this year, and it tended to take between like 10 days and maybe 24 days max to reach its full size.

And a full-size lily, would probably be, for us, we'd be expecting to see them in June. And, what's really striking about these leaves is that they are completely flat. The surface of the leaves looks almost like a kind of crocodile skin, and it is peppered with tiny, tiny little holes, which allow any excess water to dissipate through.

So, they never get swamped. And, the structure of the leaf itself, is in multiple different layers, which is now being used for bioengineering as a form of water filtration so that every single layer has its own individual, design and function.

And then underneath it's supported by loads of veins, which kind of all crisscross together in triangles. And this arrangement of veins, which are hollow, they hold a lot of air in there...this has been used for now to influence architecture.

First with glass houses actually. And now with bridges with magnificent designs for atriums out of glass and the way that it supports itself so well, um, and is now actually being used for things like potentially, um, solar panels, uh, in the sea, so that they're so strong that they can withstand waves. Uh, they're really, really quite remarkable.

**JENNIFER:** Yes. There's a lot we can learn. And there were two things that came out of what you were just saying that I really love to hear. The first is that there were no water lilies harmed in the making of the Water Lily Weigh-Off competitions.

We have people concerned that we're hurting these plants, we're not. And it's an early example of biophilic design going back, as you say, centuries. These plants have inspired architects and other thinkers about how to design, taking cues from nature. And it's great to see that that continues. Let's talk a little bit about how they are cultivated in temperate places like where we are. So, Vanessa, could you talk a little bit about the cultivation in Denver?

**VANESSA:** Yeah, so we get fresh seeds every year from Longwood Gardens. Shout out to the real masters there at Longwood. We keep them in a fridge for a

few months over the winter. So, that fridge is kept in like the lower sixties so that they won't start to germinate.

But, it's also not too, too cold for them because they are tropical plants. Maybe around February we can move them into our pretty small greenhouse ponds so they can germinate and start growing. But they are pretty limited at Denver Botanic Gardens and how big they can get indoors. So, we're growing more than we need so we can pick the best and not everyone's going to grow the strongest and around mid to late June, but it's super weather dependent....and in Denver, weather can fluctuate a lot day by day, week by week...So, we try and do our best to avoid hail and any crazy temperature swings. But we need water temps to be quite warm, like mid-sixties and up before we can move them outside. So, it's usually later June when we actually can put them on display.

**JENNIFER:** Yeah, it's a funny irony as the originator of the contest that you're in Denver, where it's, I think, particularly hard to do this. And maybe not surprising that the winner of our 2025 competition was Bok Tower Gardens in Florida, which may have something of an advantage, but they won fair and square. Note, I don't want to diminish their win in any way. Brie, could you talk a little bit about Kew's approach to growing the Victoria species, which I think is distinctive and has done a lot to shape the public affection for your beautiful Waterlily house, which I know is now under renovation.

**BRIE:** Yeah, we do things a little bit differently. I think, because all of our ponds are under glass. So, we're not so restricted by the weather, but the main thing for us is light, actually, that restricts the growth. So, we will produce seed every year.

We'll store the seed at 16 degrees centigrade. Apparently it keeps it for the longest. And we will sow that seed kind of around about February time in our nursery. And the plants will be ready to put into, for example, the water lily pond. So, we have two ponds that we display the giant water lilies in. We've got the Waterlily house, and then we've also got the Princess of Wales Conservatory, which actually has two ponds itself. And, so for example, the pot size of the Victoria, when it arrives will be roughly like two liters, maybe three liters max.

And we put it straight into this giant pot, which is bigger than me. Water. We try to keep it at 25 degrees. It does change and fluctuate quite a lot. The Waterlily house is incredibly hot. So, we would be planting around about end of March, beginning of April. So, we'll have mature sized plants in June, July, and then the plant will keep on going really until the start of November. So, we empty the pond start of November. By then the leaves will have shrunk to about almost like about a foot diameter. So, really, really quite small. You can tell that the main difference is the light availability. We don't have any additional light. And that really does play a part.

**JENNIFER:** Yes. So, light, temperature, everything is factoring in. Brie, I gather that *Victoria boliviana* can grow even larger than *Victoria amazonica*. Could you tell us a little bit about Kew's role introducing it into cultivation?

**BRIE:** Yeah, of course. So, we've described the species just recently, and that was a collaborative effort between horticulturalist, scientists, and botanical artists. So, it seems really silly now, but for many, many, many years we've been growing *Victoria amazonica* and there've been some years where the plant just didn't seem quite like the one that came before.

Maybe it was a little bit bigger or maybe it was a little bit more difficult. And it turns out that it was actually a different species. So, Carlos Magdalena, who is our water lily expert here at Kew, he visited Bolivia and he saw a stand of what is now *Victoria boliviana* as described, and he noticed that they were just so different to the other two species that we know and love. So, *Victoria cruziana* and *Victoria amazonica*. And, working with our partners in Bolivia, managed to acquire seed and then grow these plants for multiple years. And by comparing notes from scientists, analyzing DNA structures, and then also botanical artists.

So, Lucy Smith played an integral role in this, because there were so many tiny little details that was only by her eye that people started noticing. For example, that the spine coverage on the flower buds and certain number of spines, these all play a part in the description of the species. And we still need a botanical artist to produce the artworks in order to describe a species, which seems in some ways so archaic to our way of thinking now, but it's so incredibly important.

And I've actually been lucky enough to be growing this species for a little while now. I will say it is more tricky. It throws a tantrum whenever you try to change anything.

But, it's an amazing discovery. And it really highlights the need for more conservation work. You know, we can say that we know everything about this group of water lilies, but actually there are probably more species left to describe. *Victoria boliviana* is already being categorized as between vulnerable and endangered in the IUCN Red listing. It's only got five known populations. *Victoria amazonica*, on the other hand, is, seems to be a kind of least concern. Everybody knows about it. Everybody's got it. So, it's really up to us now to look for those other species and describe them before time runs out.

**JENNIFER:** Yeah. That's a really great segue, because I, I think it's important to talk about how this kind of very fun, international cooperative effort can raise awareness. So Vanessa, could you talk a little bit about how an effort like this can move from spectacle to stewardship and what it is we would like people who are viewing or coming to botanical gardens to visit to learn and maybe do?

**VANESSA:** Yeah, absolutely. Denver Botanic Gardens, our mission statement is to connect people with plants and it seems really simple, but is very layered and nuanced. But, generally people I find, learned about plants in third or fourth grade and then never again. And we have this, this sort of sense that we call a plant awareness disparity or plant blindness where people see and interact with plants in various ways every single day of their lives, but they feel really disconnected from them.

So, I really like to try and make plants accessible to any, and everyone, even if you know nothing about plants, because public gardens, these public institutions, we do so much work. We are growing food, we are protecting endangered species. We are looking for more global or ecosystem conservation work and doing a lot of science. And like on top of, and layered within our beautiful displays. So, I think Instagram, TikTok are really great ways to show huge amount of people that public gardens are a space for them.

They can learn something, and plants are important no matter where they're coming at. So, we can see "Oh my God, I've never seen a plant hold 183 pounds. I never would've imagined that's possible." Every plant has some crazy unique story that it can tell. And we interact with those plants all the time, even if we don't realize it. And we do want to encourage people to think a little bit more about the plants in their daily lives and then hopefully try and convert that into energy towards thinking about plants, protecting plants, and how our world and us depend on plants to live.

**JENNIFER:** Yeah, absolutely. And I think that these kinds of tools with the public can really be an entry point for learning a lot more about the very layered work that happens at botanical gardens. All three of our institutions are doing scientific work. Of course, we're doing educational work with, within our communities and beyond. We are caring for our living collections, all of which include, plants that are threatened...

**VANESSA:** There's a lot of, there's a lot of stories to tell. And so one big flashy one is a great way to get people to A: watch more stories, while they're sitting there on Instagram or TikTok, which is pretty easy to do. And then also to visit their gardens. We had people commenting on various water lily posts that they had never visited their local public garden, but now they were going to go see if they had a water lily and what kind of plants they had.

**JENNIFER:** Yeah. Yeah. It's also good for your algorithm because, uh, plant Instagram is the best Instagram. I think we can all agree. So, let's go back to the plant plants themselves for just a minute. And I said earlier that no water lilies are harmed.

I do want to talk about what can cause pad failure, tears, edge over topping, collapse. And what do you all take from that? What can we learn from a horticultural perspective? Do either of you want to jump in on that?

**BRIE:** I don't know about you Vanessa, but I suppose the main pest for us for Victoria is aphid. I think that has long been the case. And they're really difficult to

deal with when it comes to being on water because of course you can't spray anything. A lot of bio controls don't particularly like being on water. So, it is really, really tricky. We tend to use newspapers, and put newspapers on top and soak the newspapers and kind of use that as a suffocant almost. And then just gather up all the newspapers. Takes a long time. It takes about two hours to put all the newspapers down and then they need at least an hour and a half to work. So yeah, it's a bit of an investment, but...

**JENNIFER:** These are well cared for plans.

**BRIE:** Yeah, oh my goodness. But, when it comes to leaves that are torn, that are not looking great, that's natural. That is something that we kind of explain to visitors. I think if anything it helps to, kind of break through this idea that it's a fake plant. Sometimes when people visit, they're like, "Oh, it's plastic." Because it does look plastic. It looks too perfect. It looks like something out of Little Shop of Horrors. It looks huge. It looks ridiculous. And then you tell people that every single leaf is all from one plant and they're like, "Nope, don't believe it. I don't understand."

So, the fact that some leaves would actually be decaying, falling away...that really, really helps us. And then we'll leave it for quite a long time, probably until there's like 20 to 30% green on there. And then we'll be able to chop it away. If we do have to remove any leaves because, for example, they've out-competed the surrounding plants and we actually need to move them in order to preserve the other plants that we've got there because they're equally important...we might take it outside and, lay upside down so that our visitors can see the veining and the colors, and also the hairs.

If you've got *Victoria cruziana*, you'll know that it's really hairy underneath. So yeah, to be honest, it's never something that I've thought of, really. If they get damaged, that's fine. And it's part of the course, really, especially if you're training students to look after water lilies, of course there's going to be some damage.

Of course, sometimes a leaf will be cut by accident. You've just kind of got to go with it, and the plant will be able to deal with it no matter what.

**JENNIFER:** It makes them more approachable, I think in a way. Vanessa, could you talk a little bit about how the water lilies manipulate heat and scent to choreograph pollinators? Is that something you can talk about?

**VANESSA:** I can probably pull a few things out. It's got this super unique leaf structure and life story, and then it has a very particular pollination story as well. Just kind of just diving into these like complex plant lives some more. So, the flower blooms very briefly, which is not entirely unique, but does make it a little harder.

It will open at night and on night one, it's only producing pollen and it's going to also produce some heat to spread as scent. It's attracting a lot of beetles. The beetles are going to come in there. And get trapped in the daytime, that flower's going to close back up and those beetles are stuck in there for the day where they're going to bop around and eat what they can and get a lot of pollen stuck to them. When they open up again the next night, those beetles can fly off and hopefully put pollen onto another flower and hopefully create a successful pollination to make some more plant babies and get a nice, healthy batch of seeds.

Brie, please correct me if I'm wrong on any of these.

**BRIE:** So, in this case, the flower itself is probably only completely open for about 20 minutes, so it really puts a lot of effort into making sure that the beetles can find it with their heat and the scent and the color.

It's shining out in the darkness. It's not like there's a tiny little dot or something on the flower that is the receptive surface that will take in the pollen. It's actually the whole bottom surface of the flower. It's just a huge disc. the disco hall of the very non-PG beetle party. And then, the second night, so that's when the pollen starts to be shed. The flower will turn a really dark pink, because that will then make sure that beetles don't waste their time going for it. The beetles won't be able to see it in the nighttime. And we see this color change quite a lot in flowers to tell their pollinators that they've been pollinated or that the pollen stores have gone, or the

next stores have gone. So, there's no point worrying about that one. Spend your time on another flower, please. So, I think that is why it happens in this way.

The idea of trapping the beetles inside is a very definite way of making sure that your pollinators do their job. And we see this again in plants like *Aristolochia*. And I was surprised to note that *Aristolochia* also give a little bit of food. But, I do think that our *Victoria* plants, they are very good to their pollinators and they provide food. The whole upper surface of this kind of atrium, this disco hall that the bud becomes for the beetles, the whole ceiling is covered in food. Fake pollen for the beetles to eat during their 24 hours. So, the plants aren't harmed during the Water Lily Weigh-Off. The beetles aren't harmed during their captivity. It's all good.

**JENNIFER:** Yeah, so the beetles go in for a 24-hour or a nighttime party in a disco hall...

**BRIE:** Yes...

**JENNIFER:** Of the water lily, and then they emerge and do the work that they've been primed for. It's fascinating. Plants are amazing, everyone. Plants are incredible. That's, that's, that's great. Thank you so much for sharing about that. What other cool plants would you prioritize bringing to the public's attention in addition to water lilies?

**BRIE:** off the top of my head, I would say ant plants would be really cool. Like *Myrmecodia*. So, *Myrmecodia tuberosa* is an epiphyte. So, a plant that lives on another plant. It has loads and loads of different chambers and is actually co-evolved with ants. So, the plant itself provides a home for the ants. The ants live inside there, and in return, protect the plant.

Ants are incredibly clean in what they're doing and incredibly organized. And one of the things that they do in the areas where they live is that they have a set area for their dead, where they will place their dead so that it's nice and clean and out of the way of where the rest of the, the ants are living.

In this case, the chamber where the ants keep their dead is actually lined with root endings from the plant. So, the plant is directly benefiting from the decaying ants.

**JENNIFER:** It's amazing.

**BRIE:** Now, on top of this, it's now being found that the ants only place high protein parts. They only leave the really good stuff. So, no legs. It's brains, it's the thorax. It's all of the really juicy stuff. And then that provides tons of energy to the plant, which will then continue to provide this home. And then the ants will also make sure that they have extensions to this home. So, whenever the plant produces seed, the ants plant the seed on the same tree in the same area to extend their home.

**JENNIFER:** It was all very sweet until we got the part about only depositing the high protein parts of the dead. You know, that's where I kind of...

**BRIE:** But still really cool, right?

**JENNIFER:** But it, no, it's, it's fascinating. It's, it's fascinating and we had ant plants on display as part of our *Wonderland* exhibition here, and it was fun to talk to visitors about these very unique plants, I think, also very charismatic, if a little bit more morbid than the water lilies. Vanessa, you've had a little time to, to think. What cool plants do you think should be featured?

**VANESSA:** So as you were talking about ant plant, I was thinking about one of my favorite topics I learned about was these mite homes in leaves, which are very similar to this kind of building an ant house. A lot of plants just have little holes or little hair patches on their leaves to which is big enough to home a mite. And I got to hang out with the paleobotanist at Denver Museum of Nature and Science who discovered I think it was 65 million-year-old mite homes on leaves. The way that plants are interacting with ants and mites and literally attracting them and drawing them into the plant, feeding them often, or at least providing home and or food so that these insects then will hang out and protect them and eat the other bugs that they do not like. There's so many plants you can talk about with that, and that's so, so minute and especially the mite homes there....like tiny dots on a plant, which you can see with your bare eye if you have pretty good vision. But like they are so

small and present all around us where you just don't know that unless you kind of know to look unless you've been like trained to look really, really closely.

**JENNIFER:** Yeah, and it's about learning about the specifics, which are fascinating and engaging, but also being reminded that each species is a world in of itself. It's part of a broader ecosystem, and sometimes the ecosystem functions, the ways that plants are interacting are not obvious to people. And it's a reminder that we need to be mindful of that when we think about the role of protecting these species as we go forward. It was so fun to talk to both of you. Thank you for taking the time. I know that we are definitely looking forward to the 2026 Water Lily Weigh-Off competition. Brie, we'll be looking forward to the reopening of the beautiful Waterlily House at Kew in 2027 and Vanessa, congratulations again for getting all of this going and bringing global attention to the work of botanical gardens.

**VANESSA:** Thank you so much. It was really great talking with you.

**BRIE:** Thank you.

**JENNIFER NARRATION:** Thank you to our friends at Denver Botanic Gardens and Royal Botanic Gardens, Kew for joining us on *Plant People*. And keep an eye on social this coming summer as we once again go head-to-head in the Water Lily Weigh-Off. May the best garden win.

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