

Thinking Outside the Bud

Episode 393 - Christopher Walker

<https://www.thinkingoutsidethebud.com/podcast/393-christopher-walker>

Christopher Walker, CEO, Co-Founder of HyPAR.farm

Chris Walker is currently CEO and co-Founder of HyPAR.farm. As General Manager of Heliospectra he installed commercial and craft style facilities with LED and software from the plant sciences company out of Sweden. This is where Chris discovered the HyPAR technology and decided to not only join the team, but fund the patent. Chris has a background in commercializing cutting edge agriculture and biofuel based technologies. With a passion for clean tech and other climate crisis mitigating technologies, Chris sees his pursuit to commercialize HyPAR as globally critical to saving the the world. Chris views the overly consumptive energy waste that is currently status quo in indoor growing as short sighted driven by the pursuit to automate everything.

<http://www.HyPAR.farm>

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EPISODE TRANSCRIPT

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You're listening to Thinking Outside the Bud where we speak with entrepreneurs, investors, thought leaders, researchers, advocates and policymakers who are finding new and exciting ways for cannabis to positively impact business, society and culture. And now, here's your host, business coach, Bruce Eckfeldt.

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1:07

Welcome everyone. This is thinking outside the bud. I'm Bruce Eckfeldt. I'm your host. Our guest today is Chris Walker. He is CEO and Co-founder at HyPAR.farm. We're gonna talk about the world of cannabis about cultivation and innovation. I think one of the things I love about cannabis is just the the level of innovation and kind of new ideas and technology and things that are coming into space as people kind of figure out how to really optimize the process and particularly as the industry matures, and we're looking for more kind of interesting, cost efficient, high performance ways of growing cannabis processing cannabis, getting it onto shelves, getting into the hands of patients and consumers. And this is a really interesting one. I'm excited for this conversation. I'll let Chris kind of give all the details but where we are in kind of being able to cultivate cannabis efficiently, economically, creating very high quality products. These are all things we're going to talk about today. So I'm excited for this dress. Welcome to the program. Thanks, Bruce.

2:00

I appreciate it.

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It's good to be here. Yes. Happy to have you on. So before we get into hyper farms, and what you sort of technology in this that you've been doing here, let's get some background. How did you get into this space? How did you get into cannabis? Like, what's the backstory for you personally, that led to this path?

2:15

Well, I've always been interested in ag tech or clean tech or sustainable technologies and working backwards. I have been involved in biodiesel refineries, ethanol infrastructure and supply chain algae to diesel technology. And when cannabis started to happen, I saw a an opportunity to well start to build the infrastructure the right way. And I kind of saw that the only real experts in in the sector were going to be people that had been kind of in the shadows for for 50 something years. And yeah, I saw I saw an opportunity to get involved in sustainable cultivation. Yeah, so I got hired by a company out of Sweden, the plant sciences company out of Sweden called Helio spectra to bring their technology into the United States.

3:07

Got it? And what Yeah, and what is the technology? I mean, is, I mean, there's a couple angles here. I mean, one, I guess the kind of there's the energy angle, and then there's the kind of quality of product angle. I mean, it gives us a little insight on as you looked at cannabis, where were the the levers that you wanted to kind of play with when it came to an alternative kind of technology here?

3:27

Well, when I was working with Helio spectra, we were promoting LED lights kind of early on the curve, and a high pressure sodium and high intensity diode lamps were, you know, 90 plus percent of the of the lamps being used and being promoted into these giant cultivation facilities. And I just saw this massive waste in in those lamps. And that was kind of a bellwether, you know, it was like saying, Alright, this is the direction we're headed. We're headed in this hyper inefficient direction. And so, you know, for me, when I came across the technology that I'm now involved with, I saw that it was a quantum leap in terms of using the sun indoors. I mean, it was, it was more than just a greenhouse. In my mind, I immediately saw that there was huge potential in using highly engineered Sun tubes to bring the sun inside.

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Yeah, so let's explain because I think we need to kind of give a visual or describe a visual to folks. Yep, so we're talking about sun tubes. Explain what what hyper does and what kind of what the underlying kind of technologies

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sure hyper received a patent about a year ago to grow indoors, with highly engineered Sun tubes that replace artificial lighting, and those Sun tubes are supplemented with it LED lighting, and that's all controlled by software. So it's a hybrid of greenhouse and indoor growing. And so, you know, if you're in a sunny environment, we can, we can basically sample About 80% of the light that you would typically need to use with, you know, artificial lighting. And that that actually changes the heat load equation pretty dramatically. So climate control is not as difficult in a large and a large commercial environment. Yeah. So a sun tube is basically a, it's exactly as it sounds, it is a tube that pierces the roof structure pulls the sun in through reflective coating on the inside of the tube, it's got a curved top to it. So it pulls in light earlier and later in the day. So in a sunny environment, like say, Los Angeles or Phoenix, Arizona, you're gonna get an hour to an hour and a half more of sun in the morning and in the evening. And so that has interesting implications on kind of the kind of light that plants can receive.

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And so, so many questions. Yeah. So in terms of the actual kind of tube technology, I mean, you're basically just just reflecting and refracting light through this device through this technology so that it's shining, shining down into the canopy, but it's hermetically sealed. I mean, you still create the building envelope is maintained.

6:11

Yeah, you know, this is classic indoor controlled environmental agriculture. Some greenhouses do offer that level of control. But once you're there, you're spending as much per dollar per square foot as you would in building an indoor environment for the most part. Yeah. So yeah, I mean, we are, I like to say we are sun grown indoor. Yeah. And that's, that's essentially climate controlled, sun, full spectrum, full spectrum plants being grown indoors. Yeah.

6:39

Well, other than psyllium, lasa, and kind of the sun, like, what, what percentage? Like, I guess, what's your loss percentage on the, I guess, how efficient are they from? What can they capture? And what can they transmit? And then, like, is there any change in the nature or quality spectrum of light that's actually getting to the plant.

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So first, on the quality of light, the sun tubes do something interesting to light, they kind of smooth out the, the spectrum, okay, it's the same, it is the exact same spectrum, as you'll see under the sun outdoors. And we've measured that with spectrometers, you do lose a little bit of light. And of course, this is geography specific. Yeah, the more sun you have, in, say, like, I keep coming back to Phoenix in Los Angeles, the more sun you have, the less light you lose. So we, through our measurements, we believe we can supplement up to 80% of the light. And so they're super efficient. Yeah, that's way better than you're gonna get at a greenhouse, as well. There's something about the tubes that, that allow the light, as I said, to kind of get smoothed out. And so you have like a, you have a much more efficient absorption with the plants than you do say outdoors or with with the greenhouse, there's, there's something about the tubes that smooth the light intensity,

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and so meaning the plant kind of likes it better. Yeah, and of course, this

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is very, you know, unscientific, right. We're not we haven't gotten to a point now where we really understand this. But when we compare outdoor greenhouse and our technology, the testing results that have come back from our beta facilities have shown that we are able to derive higher terpene levels, the brix counts of food is higher. So there's some piece of knowledge in there that we that we can't really articulate at this point. But there is proof that the the sun tubes, do something with growing a plant that make it make it make it more efficient, make it make the actual plant growing process more efficient. And interesting.

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And you mentioned that a supplement it with some LEDs like how are you supplementing for time of day, are you supplementing for like cloud cover and things like that? Like how, how does this system work between the Sun tube and the LED,

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right? So just like in a greenhouse, so we take what's called de loi software or daylight integral software that would typically be used in a greenhouse. And we tell that software how much light the plant wants to see. So every every plant has a DOI factor. Cannabis is a very light hungry plant. So the software does its magic and it says, okay, the sun is giving the plant all the light at once right now. Okay, the clouds are going over where you need to supplement with the LEDs. Yeah, right. So and then if you wanted to do something with blue in the morning or red in the evening, you could tell the DLA software to do that. So interesting. Yeah, so we know that we know that plants love blue in the morning and love for red in the evening. Yeah.

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And in terms of the physics of the actual tube and stuff and we were what are the limitations in terms of distance? You can cover bends you can turn right like we're like practically how does this system work? Engineering watch.

10:01

Right, so the tube is actually provided by a third party company called sola tube, they have been in business for about 30 years, when they developed this tube, they did not realize what they had done in terms of its application for agriculture, it turns out that it could not have been designed better for agriculture. So through their software, we're able to do light plans, and just like you would with any led lighter or, or HPs light, we can determine exactly how much light the canopy is going to receive. You know, interestingly enough, the the tube actually can be bent, and it can be formed into angles that can pull the light in, you know, if you've got some kind of infrastructure in the roof that doesn't allow for, you know, a tube to be straight down into the building envelope, but we don't do that we, we go, we you know, we

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use the gibbon keep it simple. Well, we

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use the standard tube, it's kind of the most light in. And, yeah, I mean, to answer your question, I guess a little bit more the tube sticks out of the roof, about a foot and a half to two feet, there's a light capturing device on the roof. And then it drops down into the building envelope beyond the roofline, another two to two and a half feet deep. And there's other things you can do with the tube, you can put amplifiers on it. You can put dimmers in it. So if somebody wanted to do full light deprivation, that's a possibility.

11:23

Got it? Yeah, I imagine, you know, as I'm kind of scrolling through my Instagram feed, and I'm getting ads for these games of zombie apocalypse games, where you're building structures underground, like can you get like, could I build a bunker like 200 feet underground and start growing cannabis? And it was something like this? Yeah. It's

11:39

really interesting that you asked that I was approached by a group out of Puerto Rico, that has access to all of the underground bunkers that were built during World War Two. And they said, I know, they said that there's something like four and a half to five acres. Wow. of bunkers. Yeah. So you know, obviously, we were pretty paranoid. And we decided that that was a good idea. as it sits today, the environment down there is perfect for growing plants.

12:05

Yeah, exactly. Yeah. I mean, humidity control and temperature control.

12:09

Yeah. Humidity. Yeah. Right. Right. Aside from light, they don't have any light. Yeah. Right. So they have approached us and they're, you know, they're looking into the engineering involved in drilling large animals. And, you know, I don't know where that's going to head. But if you were to do the roof structure in advance, yeah. I mean, this is, this is this is a perfect marriage, you know, between using sunlight and using the insulation factor of the earth to grow food or, or cannabis and underground? Yeah.

12:43

Well even think of just like these, you know, vertical farms, where, you know, you're you're dealing with kind of multi, you know, Multi Floor, multi storey facilities. And I can imagine some kind of rooftop light harvesting setup system that could then pump down to various floors and create kind of even or you can bring light down through a structure so that you don't have to have it's not just a one, one to one roof to canopy ratio.

13:08

Yeah, we, yeah, we get approached with that question all the time. I'm sure. Yeah, it's a trick, right. So one thing that is in our favor in terms of using the technology in a vertical farm, is the fact that the vegetables and fruit don't need as much light as cannabis. Yeah. So you could do some kind of a rotating, almost like a, it's almost like a ladder structure. Yeah. Where the trays rotate upwards towards the sun. Or you can do some, you know, there's also grow towers that can be used. There's a lot of, yeah, there's a lot of the, you know, there's a lot of a lot of commercial growers that are using grow towers these days.

13:45

And as you're approaching the cannabis market, I mean, I guess, are you uniquely focused on cannabis? Are you looking at multiple different kinds of agricultural applications for this?

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So you know, all the founders have experience in the cannabis sector, which I think bodes well for our future in that you couldn't have picked a more difficult sector to attempt to bring technology into. But you know, the answer is that that we all believe that this technology is best suited for bringing food to climate crisis affected regions, obviously, the higher value cannabis crops and the massive carbon footprints that these cultivation facilities have. Yeah, that's huge. Yeah, yeah. So those two factors, they definitely promote us working in the cannabis sector. Right now. We've got four demonstration facilities, they're either hemp or cannabis. Now. Yep. So we, we'd love to get more involved in food security, and that's definitely the direction that we're focused on. Yeah.

14:45

And in terms of what you're finding in cannabis, are these typically new facility building into construction? Are you retrofitting like what where have you Where are you finding the application and where are you finding the economics?

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The economics are definitely found in new construction. So integrating insulated panels, prefabricated walls, prefabricated rooms and ceilings, you know, there's a there's a huge efficiency that's found in there. Retrofitting is difficult unless you have the perfect roof structure. Most don't. Yeah. So we decided to design our own cultivation facilities, everything from a small couple 100 square foot garden pod that would be used at home, all the way up to full blown new construction, using insulated panels and the like. And then in the middle in there, there's a, there's a group that we're working with to design facilities that are built off site, come on a trailer, and require some but not a ton of construction on site, but their full blown commercial cultivation. Facilities modular Yeah, built to suit.

15:56

Yeah, kind of prefabricated, or partially prefabricated facilities. And, you know, given this world that we live in here in the US with all this kind of state by state, you know, markets and regulation, everything, which markets, which states, are you finding kind of most interesting, either kind of economically or from a regulatory point of view, or the structure of the industry? Like, what, where, where are you seeing traction? Or where do you anticipate that you'll have, you know, traction in terms of the US market?

16:22

Well, we've determined that our technology is best suited to environments where there's a lot of sun, rowers are experiencing climate control issues, due to either extreme heat or extreme cold, and electricity is expensive. So, you know, that's California. That's some East Coast states. You know, maybe it's maybe it's Arizona and New Mexico, Texas, southern states. There's also something very interesting about working pretty far north, in that the Scandinavian countries have very expensive electricity, but they don't get any sun in the winter, and then ton of sun in the summer. So yeah, there's some interesting economics in there, too. So

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yeah, it's almost almost kind of light banking, or you need like batteries of some sorts to be able to store it offseason. But

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if you can figure that one out. We're both gonna get rich fast.

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Yeah, exactly. Another episode. Yeah. And in terms of, you know, your own kind of supply chain and production and things like that, like you mentioned that this the some of the technology is made by third parties, like, what's your as you look at entering these markets? What is the scaling of the business scaling of the technology actually entail? What are you? What are you noticing? I mean, we're coming out of this kind of pandemic supply chain nightmare. What has your experience been there? Well, fortunately,

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we have a huge company behind us sola tube, they're very excited about our technology, we've been working with them for several years, they have a supply chain, that's been, you know, 30 years in the making. So we don't manufacture we don't store or distribute anything, we have a patent on the process. So we assist growers in design, and getting the hardware to their facility, and then implementing the hardware once it's there. We charge licensing fee for their usage of the technology. But we're taking as close to an open source approach as possible. And you know, for this, for the first few facilities that we build, or that we're involved with, we won't be making any money, we want to just see this technology get out there. In terms of the supply chain, we, we want to work with groups that are already established, that already have products in the marketplace where we can put our tech in the in the roof, or the ceiling structure, we have found that with the design, there's this gap in the I wasn't aware of this until a month or so ago. But there's this gap in the home grower market, between cutesy little garden garden greenhouses that are expensive, that don't really work, and then tents that you'd put in your closet, and then, you know, tough sheds that people try to grow in that aren't climate controlled enough. So that little group that's, you know, say sub 15 to 20k. Yeah, up to the much more, you know, thought through highly engineered cultivation structures. There's this gap between like the \$20,000 price tag, and that 150 to \$200,000 price tag. And so, we have started to design these carts, these garden pods that are basically the foundation by which someone can be set up for success. Yeah, they're highly insulated. They have our tubes in them. They have white walls in them that can be sprayed down and are reflective. They've got a drain in the corner. So that's the basic one right there and so the grower can do whatever they want with it. So you

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can actually just roll roll up with one of these sayings, plop it onto a property and start Trying? Yeah,

20:01

yeah. Then the next version of that the advanced, the more advanced version of that has the electricity, the plumbing, the H back everything built into the walls built into the pod. It's not totally plug and play, but it doesn't take professional to install it. But it's still going to be sub 100k. You can feed your family, you can feed a restaurant.

20:21

Yeah, this whole kind of home market in cannabis is a fascinating, kind of underdeveloped or developing kind of area. Where Yeah, I mean, you obviously have the legacy folks who have, you know, people that were doing

things in closets and basements and garages and things like that. But now that, you know, we're getting legalization, and people are having, you know, a lot of states are creating the illegally creating the ability to have grown cannabis for personal use at some, you know, some limited plant quantities and things. But he has a whole fascinating market. And I've seen a couple of these tech plays for home ground things. Yeah, they're either they're, you know, these kind of high tech AI. Potts, that, that'll that will auto grow cannabis for you, or? Yeah, these kind of more elaborate tents and things like that. But this is an interesting one, you know, given the way kind of cannabis is playing out the cannabis market, you know, particularly the last 612 months, you know, I'll I guess a lack of capital, or at least, you know, capital constrained, in many respects profit constrained, where are you seeing? Or where do you anticipate kind of real the companies that can actually invest in this kind of technology? Or in the kind of new facility development that are a candidate for you? Who's actually interested in this? And why and where are you seeing kind of the challenges and actually getting this technology into the industry?

21:37

Yeah, first, the challenge is, I think that there's something about ag tech that everyone gets very excited about when it comes to new innovation, but nobody wants to be first. So every everybody wants to see that scale before they implement it into their own cultivation facility, right. So our job is to do that show growers that it works at scale. So that's why we're doing our own cultivation facilities, and trying to control our own destiny there. At the same time, you know, we get several calls a week about designing facilities, that that will either be retrofit or new construction. So there's something about the market coming to us, and there's something about us going to the market. And then in terms of, you know, investment dollars, my hunch is that it's going to come from a supply chain partner is somebody you know, somebody that is, sees the value and understands that because we can save growers, you know, minimum 50, up to 80% in their electricity bill and sees that there's this shift in focus from reduction of CapEx to reduction of op x being more important. You know, I think that there's going to be, my hunch is that it's going to going to come from the food security side first. Yeah, so I think that I think that answers the question for the most part, but we have not taken any investment dollars. And we're proud of that. And, you know, thus far we've bootstrapped, we do plan on doing, you know, a crowdfunding raise when, when these when these garden pods are finished. And so, you know, if we can, if we can entice, grow investors to get involved there with with that revenue stream, that'd be cool.

23:18

Interesting. I'm curious on the cannabis side, like you kind of analyze the market, or the process by which these facilities get designed and built, like, Who Who are the people that are really going to kind of influence this, I mean, because you've got the growers, but they're really more, you know, once the facility is in place, they're figuring how to grow inside of it. You mean, the architects and engineers are getting involved in the design, but there still is a couple of architecture firms, engineering firms out there that know at least something about the cultivation process and know how to design I mean, you've got some consultants, cultivation consultants out there that are doing some of these things, like, as you look at who you want to kind of really influence or, you know, talk to in terms of the people that are going to make the decision to use a technology like this, like, Who is it in the industry that you're really focused on? Yeah,

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I'd like to say that it's facility designers, they can be a tough crowd. Yeah, they tend to think in terms of engineering, meaning that they take their marching orders from their clients. Yeah, from my experience, the more motivated crowd tends to be the investor. And in this case, it could be the real estate investor. So as

vertical growing continues to see a black eye in terms of going under going bankrupt and not being able to take down the same dollars that that it did, you know, over the past 24 months or so, other new technologies are going to be looked at and interesting. And I think that there's going to be some, some kind of a play with real estate investors that that want to build facilities for long term lease and are hyper focused on sustainability and energy. usage reduction. That I mean, it's not as sexy as going straight to the industry and the industry being motivated, you know, but at the same time, you've got greenhouses in in Europe that are going out of business, because of the electricity prices, some of those electricity prices are bouncing back and not as not as high as they were six months ago, but at the same time, you know, it does create an opportunity to develop real estate in a much more sustainable way, versus attempting to throw hundreds of millions of dollars at vertical farms that have a ton of AI built into them, and are super tech heavy, but are just growing lettuce.

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Yeah. Are there any kind of regulations or trends, you know, from a kind of a legal regulation or, you know, even kind of industry standard point of view that you're kind of rooting for, you know, that would help your case in terms of, you know, the sustainability, the efficiency, the environmental aspect of your technology?

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Well, you know, I'd say that California is really ground zero for regulations and for new, more stringent building codes. But in terms of the, you know, I tend to look more at the free market. And it seems that there's a there's a I mean, the answer is definitely yes, there's, there's an enormous amount of money being thrown from the federal government and from state governments into sustainable building, and sustainable agriculture. You know, we've applied for an SBIR grant, there are codes that continue to pass legislature in specifically in California, that make it you know, more stringent to build, but I tend to come back to the free market. And it's really the unpredictability of electricity pricing that I think is going to promote our technology the most it's our technology is kind of it is somewhat capex heavy, but at the same time, that's your insurance policy against fluctuating electricity price, right? If you can reduce your your dependence on electricity by 50 to 80%. That sounds like that's pretty big deal.

27:05

Yeah. Let's Yeah, Chris, this has been a pleasure. If people want to find out more about you more about the technology, what's the best way to get that information?

27:12

HyPAR.farm, HyPAR.farm

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right. I'll make sure the links are in the show notes here so people can get that. Yeah, Chris, thank you so much for taking the time today. It's been a pleasure. Thanks, Bruce. I really appreciate it. That's it for this episode of thinking outside the bud. Be sure to subscribe using your favorite podcast app so you don't miss our future episodes. See you next time.

27:33

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