

AI Eyes On Old Tractors

[00:00:00] **Sumod Nandanwar:** Hello, everyone. I'm Sumedh Nandanwar, uh, co-founder and CTO at Perplant. We are building the AI eyes, uh, for the farmers' favorite machinery, uh, their tractors. So that's essentially to democratize the access to technology as an overarching mission, uh, for our company. But, uh, through that, we are trying to make farmers more profitable and sustainable at the same time by, uh, helping them reduce the amount of chemicals, uh, in the field

So agriculture overall is, is, uh, facing quite some, like, fundamental issues in itself. Mainly it's, it's about the farmers. Farmers are in the paradoxical, like, uh, uh, moment, a pincer moment. Like, they have been pinched together from different directions. Um, like, uh, on one hand, like, climate is just getting volatile day by day.

Average [00:01:00] weather is not average anymore. Things are fluctuating insanely. So for them, um, they are not able to rely on what they have been doing over the years as practices. So they need the real-time data on what is happening right now in the field. On the other hand, like, their margins are shrinking.

There is, uh, like they've been asked to do more with less, basically, uh, with the regulations pressing them to, to reduce the amount of chemical usage, right? Um, uh, to make planet more sustainable. But at the same time, they need to be profitable and, uh, their margins are reduced from the other hand by the, by the value chain itself, like the, the buyer companies.

They are pressing them down to reduce their margins. So they are, like, forced in different dimensions. So it's, it's, it's terrible being a farmer, uh, at this point of time. And to do more with less, it's a, it's a fundamental problem of efficiency, right? So how do [00:02:00] we, how do we give them these tools which can help them being more profitable with what they already have?

So in a nutshell, like these, these are the major, uh, problems that we are trying to address, like, uh, in terms of, like, giving them the access to, uh, a tool which can, which can tell them about, like, what is happening on in their field right now, and which can earn a bit more bucks in their pockets to make them a bit more profitable.

In my opinion, precision agriculture is nothing but that. Uh, is giving farmers the right tool or to use their existing tools to get efficiency and the best efficiency to, uh, to produce more effectively, profitably, and sustainability with the less tools that they already have, basically. So, so that is what precision agriculture is for, is for me.

I mean, technology-wise, uh, like, uh, it, it ranges in multiple, multiple [00:03:00] different segments. Like, there are data tools, like cloud-based data tools, which, which gives the farmer, um, like, uh, an insight on how their fields have been performing, like, over the years. Uh, uh, there are, like, uh, sensors which are more, uh, ground-based sensors, like moisture, soil moisture sensors.

Uh, camera-based sensors which are, uh, which is like more, uh, into our kind of category. And then, uh, the, on the last segment it's more, uh, the systems which automate the farming in itself, uh, like robotics, um, agriculture robots and stuff. They-- So, so these are all, uh, all the tools and I would define all of these, these tools in precision agriculture itself which is effic- uh, like actually just helping the farmers increase their efficiency more or less, solving the efficiency problem.

Yeah

Higher-end [00:04:00] technologies like drones, uh, access to use of satellites, the, it has been there for years. It's, it's nothing that, like, the technology is new per se or, um, right? So technology has always been there, but the problem is that, like, they have not been reliable in terms of the ROI that they've been able to provide to the farmers, like, successfully.

So if you simplify that, so it has been nothing but problem of, um, problem of, like, either they are very expensive on the one hand. Uh, so if they are expensive, they are not able to catch the ROI because farmers' margins are lower. Like, they, they will invest, like, low on low-- less and less on technology. So they don't have big pockets to actually invest in, like, heavy or high cost, um, uh, or expensive technologies, right?

So it's either, either, like, the ROI problem or the accessibility problem in the other sense is that, like, [00:05:00] for a farmer, it's, it's very fundamental like, uh, for a farmer, he gets 25 harvest in a life to make, and that means 25 business decisions overarchingly. So if he, he has to make, make that decision, like, that goddamn tool has to perform.

If it doesn't perform in that year, then he lose, he loses that year. And technology has been, like, over the years, like, just not performing with respect to what they wanted, or they have not been able to fit the ROI bucket, like as I said before. So these are the two major things that we are trying to address.

Like, we, we thought about, like, we talked to many different farmers and realized ROI, so it has to be affordable and h- it has to be accessible. So, so as per plant, we-- our whole mission is to give the farmers this tool that we are building in an affordable way and a more accessible way such that it fits their existing tools.

So what we are [00:06:00] essentially building is, is nothing but giving AI-based eyes to farmers' existing machinery which they already have, their tractors, basically. So making their tractors more efficient than what they are already today. It's a tool which can see how the crops are growing in the front, compute what, uh, what, uh, what it means by that, how much amount of inputs does it require, and then in real time control the amount of inputs that are going into the field.

So that is what we do basically, uh, as of today. But while doing that, we also collect a large amount of data on the crop growth. So because tractor is the tool which runs across the field in the highest amount of frequency, like the most number of times, we get to see how the crop is growing and what are the problems in the field.

That is what we want to automate going further. So as a start, what we are trying to solve is nothing, but we are [00:07:00] trying to solve, uh, uh, see and spray problem, so see and spread problem. So give only the amount of inputs that plant needs in real time, solve that problem. But overarchingly, what it's gonna solve is how the plants are growing, what are the problems being happening in the field, understanding those, and then being able to automate that for the farmers themselves to actually make their business decisions more and more smarter

Farmers essentially need a red and a green button tool. This is, this is, this is needed for the technology companies in, in agriculture. We need to understand this. Uh, even more, it's better if it's just a single button, which is red button. So to simplify this process, what we do is not give them the data, not give them, but rather actually make the tractors automate in a way that they can act in real time as well.

So not only the AI-based [00:08:00] eyes try to understand what is seeing in the front or what the c- how the crops are looking or what is their health condition, how much inputs do they need, but also actually controlling the tractor to act upon it in real time is what, what we have, uh, we have solved. And, and it's one of the biggest problems in agriculture, actually, is to make this tool, like, retrofit their existing machinery so, so that it works across different brands, basically.

So this is what is one of the major problems that we have solved, is to actually being able to make the system control different types of machines in real time, uh, so that farmers can get this automated, as I said, like just red and a green button tool to, uh, optimize their inputs, basically. In terms of, like, benefits to the farmers and, um, and to the planet, like, it, it kind of, like, goes hand in hand.

We have managed to get [00:09:00] quite some reduction in the amount of fertilizers that go into the field, fungicides that go into g- into the field, and even, even the herbicides. So in terms of, like, analyzing, uh, analyzing the crop biomass levels and then recommending the right amount of dosage and actually controlling that dosage in real time as a on-the-go tool, uh, we have been able to save up to eighteen percent of fertilizer usage for the farmers, uh, about, like, uh, twenty-five to thirty-five percent of fungicide and about thirty-five to max eighty-seven percent of herbicide usage, uh, for the farmers overall.

Like, in, in past two years, to give you a specific amount of number, yesterday I got to just, just check, uh, stats, and I found that we have, uh, like, reduced around two hundred and thirty thousand liters of amount of chemicals in total by actually, like, scanning around, like, hundred and seventy thousand hectares of [00:10:00] land.

Um, but that's been just, just in, just being in the Nordics itself, where, where the farms are actually even smaller. Uh, this year we're gonna expand in bigger, bigger, uh, bigger countries, and our i- impact is gonna, like, increasingly, like, ten X this year, basically. So, so definitely looking forward to that.

We entered EIT Food program like, uh, about two years ago, uh, sort of. And, uh, like it has given us access to, uh, not only, uh, like the commercial big guys in the field basically. So, uh, we have had chats with John Deere, got the access to have a chat even with John Deere in terms of like understanding what is their vision about like precision tech and where are they heading as a company.

Uh, very interesting. Um, so getting access to these big guys even as a startup is extremely valuable, uh, because [00:11:00] like getting the right touchpoints in

a big corporates, uh, is the most important thing basically, right? So, so that, that has been very valuable to us. Uh, other than that, like we have gotten access to other, uh, demonstration-based programs like where we were able to get, uh, access to some specific farmers in, um, in Sweden, Finland, for example.

Also, uh, in access to some farmers in Spain. So like commercially, it has been extremely valuable to us, um, to, to actually like help Purplant grow commercially. We are at a very, very interesting point, point in the company right now. Very much looking forward to what we are building. Uh, to put it into words specifically like this year, pa-- I would call it a, a global seedbed year for Purplant.

So we'll be expanding into, uh, at least 10 plus countries this year, going a-across trans-Atlantic like so. Um, [00:12:00] entering North America, South America market. Um, hopefully getting also into South Africa and Australia this year as well. Just trying to an entry but for sure like in North America and South America, Canada.

So definitely looking, looking forward to solve, uh, different challenges like coming from these different markets, uh, or what they have to offer. Uh, but essentially very excited about the growth, uh, that we'll have, uh, in, in these, in these different markets. And on the technology front end, like, uh, very much excited about like what we are solving, like the amount of, uh, amount of data that we are going to gather from just having like tractors run, uh, across the fields like in, in across the Europe, across the North America, across the South America.

We'll be able to understand like how the farming is actually happening like in, in, in these different, uh, in these different spaces of agriculture across the [00:13:00] world and being able to building the tools to help farming evolve even faster basically. So we, we have a vision, uh, that we want to make, um Make the b- make the farming run at a speed of a week.

What, what we mean by that is nothing but if, if a farmer sees something in the field and he would like to analyze that problem, I would, uh, I want to offer, as a Perplant, we want to offer the tool to the farmer to be able to do that within a week time, not within a year's time, basically. So that is what we are trying to solve.

So essentially, like, farmer could literally, like, pick and choose that, okay, like, you have eyes on the field, you see this is a problem in the field, and farmers should be able to actually, uh, analyze those within a week time, more or less.

Uh, detect and analyze those within a week time. So that will just open up, like, broad [00:14:00] amount of, like, uh, problems and, uh, problems that we can actually solve, uh, to make this industry, like, more sustainable and better.

Farmers are in crucial, crucial, um, pressure, as I said, and if we are not doing something about it, like, our food is in danger. So yeah. Uh, we as humans should just be careful about it, more or less. Yeah. That's... That would be my, yeah, last thought.