Tools & data

Background 2 May 2019

‘Precision farming is key to growing better crops’

AgTech start-up Taranis grew from 4 to 80 people in just a few years. A rollercoaster for CEO and founder Ofir Schlam, who says we are still in the early days of precision agriculture.

In its 4 year existence the Israeli start-up Taranis has seen huge growth. Taranis started as a tool to provide farmers with the information to detect and prevent crop disease, weeds and insect damage based on weather forecasts gathered from aerial surveillance.

The technology was then further developed by adding visual layers from satellites, planes and drones and leveraged with AI capabilities. Taranis also created a one-of-a-kind, patented hardware that can capture accurate images at a high resolution from a plane flying at 160 km/h, such as a specific insect on a leaf from 200 feet above ground.

Text continues underneath image

Taranis CEO Ofir Schlam in the field. "We are in the early days of precision ag and the technology and its adoption is still maturing," he says. Photos: Taranis

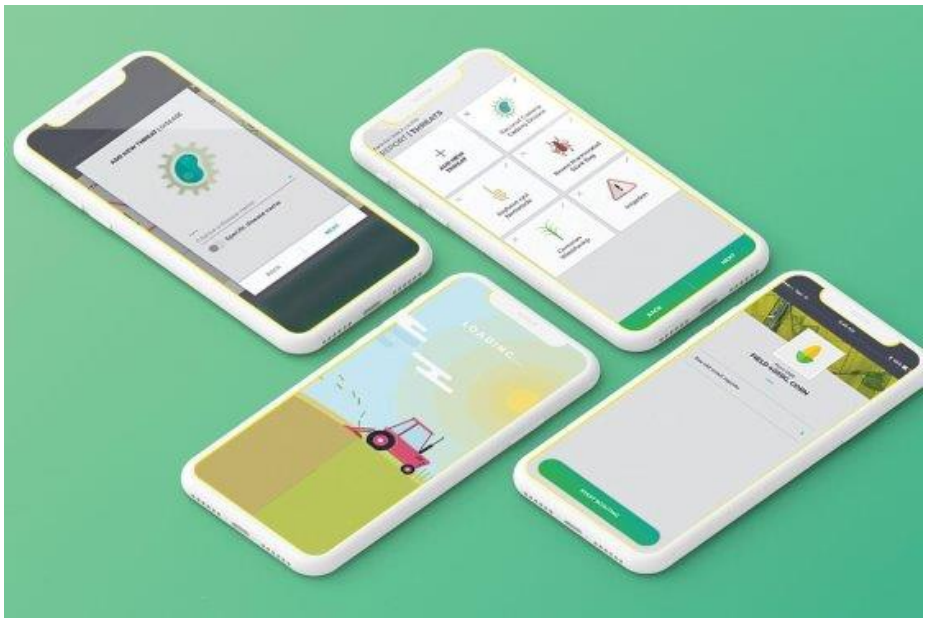
Taranis CEO Ofir Schlam says the future of the precision farming industry is looking bright, with thousands of start-ups emerging within the last 10 years. According to him, smart farming is projected to create a massive impact on the agricultural economy in the near future and will be dependent on precision technologies, such as the adoption of automated practices and indoor urbanised farming. All these new innovations will help propagate the growth of farming crops.

At what level are we now when it comes to precision agriculture and remote sensing?

Ofir Schlam: "We are in the early days of precision ag and the technology and its adoption is still maturing. The point where it gets interesting is how precision agriculture works in conjunction with the previous revolutions of the last 100 years: machinery automation and robotics which implement plant prescriptions, better hybrids and GMOs and more advanced chemicals and biologicals. Everything needs to work together because food will largely continue to be grown similar to today, with most major commodity crops rain-fed on mostly large farms in the US, Brazil, Ukraine and Australia."

"However, there will be tweaks in the way certain crops are grown for efficiency purposes. These crops and geographies will offer the first landing ground for the top technologies, posing the biggest opportunity for trial and success. Smaller farms may soon be disrupted in a similar way with the help of large indoor facilities with artificial lighting and fully robotic management, bringing precision agriculture to more controlled farming environments. Additional adjustments may also need to be made due to the impact of climate change on agriculture."

Text continues underneath image



Taranis started as a tool to provide farmers with the information to detect and prevent crop disease, weeds and insect damage based on weather forecasts gathered from aerial surveillance.

Why are many farmers hesitant to invest in smart farming solutions?

“Farming is an age old industry with many farmers operating in the agricultural sector after generations of family farms, yet we are beginning to see different opinions out in the field. Some of these farmers often encapsulate the old adage, “If it ain’t broken, don’t fix it.” They are conservative in their ways, fearing change and disruption.”

“But today, they have become the minority. Between the generational shift and the drastic way technology has changed our lives as consumers, today’s farmers are more aware of the capabilities the latest technology can provide. These capabilities are the driving force behind further adoption in agriculture.”

“In general, I believe farmers are very smart when it comes to choosing how they manage their expenses. They do trials on any new seed variety and they have a methodology of how to test new agtech in order to see if it is beneficial.”

Text continues underneath video

How will an arable farmer run his farm in 5 and in 10 years from now? What level of automation / AI will be involved?

“I foresee machinery companies continuing to create more autonomous farming machines, that we and other precision ag companies can leverage to implement our diagnostics through prescriptions. Similarly, drone and irrigation companies like Netafim and Lindsay will use their existing systems as data platforms that are well suited for data collection.”

“Naturally, drones will continue their trajectory towards better autonomy with better battery life, overcoming regulatory constraints. I believe in 5 years “see & spray” will become popular, empowering growers to make every individual plant count at scale. In 10 years, farms will almost be entirely automated and unsupervised.”

Text continues underneath image

Taranis uses drones and manned aircrafts to get higher resolution images, beyond those of satellites, during specific times of the season, enhancing decision making.

When to use satellites, drones or manned aircraft for remote sensing?

“Satellite imaging is limited due to weather conditions such as clouds and its resolution. Taranis uses drones and manned aircrafts to get higher resolution images, beyond those of satellites, during specific times of the season, enhancing decision making. Our UHR technology is equivalent to what most drone companies do today but we just do it in massive scale using manned aircrafts.”

“There is a booming industry of light aircrafts where pilots are being trained for the huge demand by the airlines, so we take advantage of this availability and task these planes with our missions over farms. UHR is efficient to create prescriptions and identify problematic zones.”

Ofir Schlam:

“In 10 years, farms will almost entirely automated and unsupervised

“When we look at our AI2 technology we take images at lower altitude so that can be done by either drones or crop-dusting planes where regular manned aircrafts are not an option. That is why we use dozens of drones fitted with our special hardware to power the AI2platform. That platform allows farmers to recognise what is wrong in those stressed areas and even see problems before

they have an economic impact. UHR can capture around 14,000 acres per hour, while AI2 can capture 1,000 acres per hour."

Israel breeding ground for agtech

Israel seems to be a remarkably fertile breeding ground for agtech start-ups and investments. According to Ofir Schlam, that is no coincidence: "Even before founding of the state Israel's founding, pioneers emphasised on cultivating the land with the use of innovative and efficient agricultural techniques. Given Israel's position as an isolated country that could not rely on neighbours for trade, its people had no choice but to develop its own inventive agricultural solutions – highlighting the deep links between survival and innovation," he says. "While Israel's tiny size makes its massive influence in tech and innovation all the more remarkable, there's a clear link between the country's geographic smallness and innovative greatness. The proximity of a variety of top-tier academic, research, and corporate institutions together with advanced aerospace, military and intelligence technology industries creates a formidable, closely linked base of human capital, helping entrepreneurs build networks and experiment with creative strategies on a small scale before implementing them globally. Specifically for agtech the fact that Israel is so small makes it possible and common that the same people who are involved in farming are in close enough contact to those in the heart of the high-tech industry or serving in military intelligence units, whilst sharing the same background."

Will remote sensing by drones eventually be substituted by (open source / available) satellite imagery?

"That may be the case but to have imagery equal to our existing commercial solution of AI2 – to get to that kind of optics and accuracy – will take a whole new breed of solutions, so I would say that could happen in 30-40 years. It may just not be necessary to have that breed of satellite developed. At least not for agriculture, but perhaps for military and intelligence purposes."

Text continues underneath image

Ofir Schlam: "At Taranis, we prefer remote sensing over a physical sensor due to its higher scalability which is crucial in agriculture."

How do you measure soil moisture content?

“At Taranis, we prefer remote sensing over a physical sensor due to its higher scalability which is crucial in agriculture. Specifically, for soil moisture we would use a combination of our IR, NIR and thermal imagery capabilities to understand crop water stress and soil moisture. We can cross that data with accurate weather measurements and forecast to enhance that analysis further.”

Ofir Schlam:

”The best decision isn’t always the one that maximises yield

What is the next step (in precision farming) by Taranis?

“Our goal is to enhance our system to be able to automatically assess a farm, identify a problem and provide detailed diagnoses and actions in real-time to prevent problems and optimise yields – without disrupting nature’s natural course. “We want to be the go-to solution for any farmer, coop, ag retailer and agronomy consultants who want to offer a precision ag program. The ultimate goal is to help farmers worldwide to maximise yield, profitability and

sustainability of every acre of soil and make every management decision as easy as possible."

This year, Future Farming is looking for the 'Top 10 most innovative arable farmers worldwide'. Do you have any suggestions/tips for those Top 10 farmers?

"It's important to continually try out promising technologies so that the results are meaningful for you and for the tech company in question. It's important to focus on ROI and profitability and not necessarily expenses and yield. The best decision isn't always the one that maximises yield."

Profile: Ofir Schlam

Age: 32
Education: B.Sc. and M.Sc in computer science
Ofir Schlam's background is deeply rooted in agriculture, with 4 generations of farmers. Schlam however was more interested in technology, computer science and maths. After completing his B.Sc. in computer science whilst still in high school and serving in an intelligence unit in the Israeli military for 9 years, in 2015 Schlam had gained a wealth of tech and management experience and felt ready, together with Ayal Karmi (COO), Eli Bukchin (CTO), Asaf Horvitz (VP Architect) to merge his passions for technology and agriculture to form Taranis.

Hugo Claver
Web editor for Future Farming

Read more about: Taranis, Satellites Imagery, Remote Sensing, Drones & UAVs, Remote Sensing, Satellites Imagery, Israel

https://www.futurefarming.com/Tools-data/Articles/2019/5/Precision-farming-is-key-to-growing-better-crops-421886E/