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Company & Product Overview *September 2019*

CropX – *Company & Product Overview*

CropX is an innovative Ag Analytics company that is leading farmers and the entire agricultural value-chain around the globe into the era of connected soil, navigating a trillion-dollar global industry to grow more with less using impactful insights from where agriculture really happens– the soil.

CropX provides the world's first fully DIY farm management platform, offering a scalable, user friendly, cloud based, integrated hardware and software system which includes easy to install sensors with IoT connectivity and a patent-pending unique spiral design for unmatched accuracy that measure soil moisture, temperature and electrical conductivity (EC) and then send that data to the cloud.
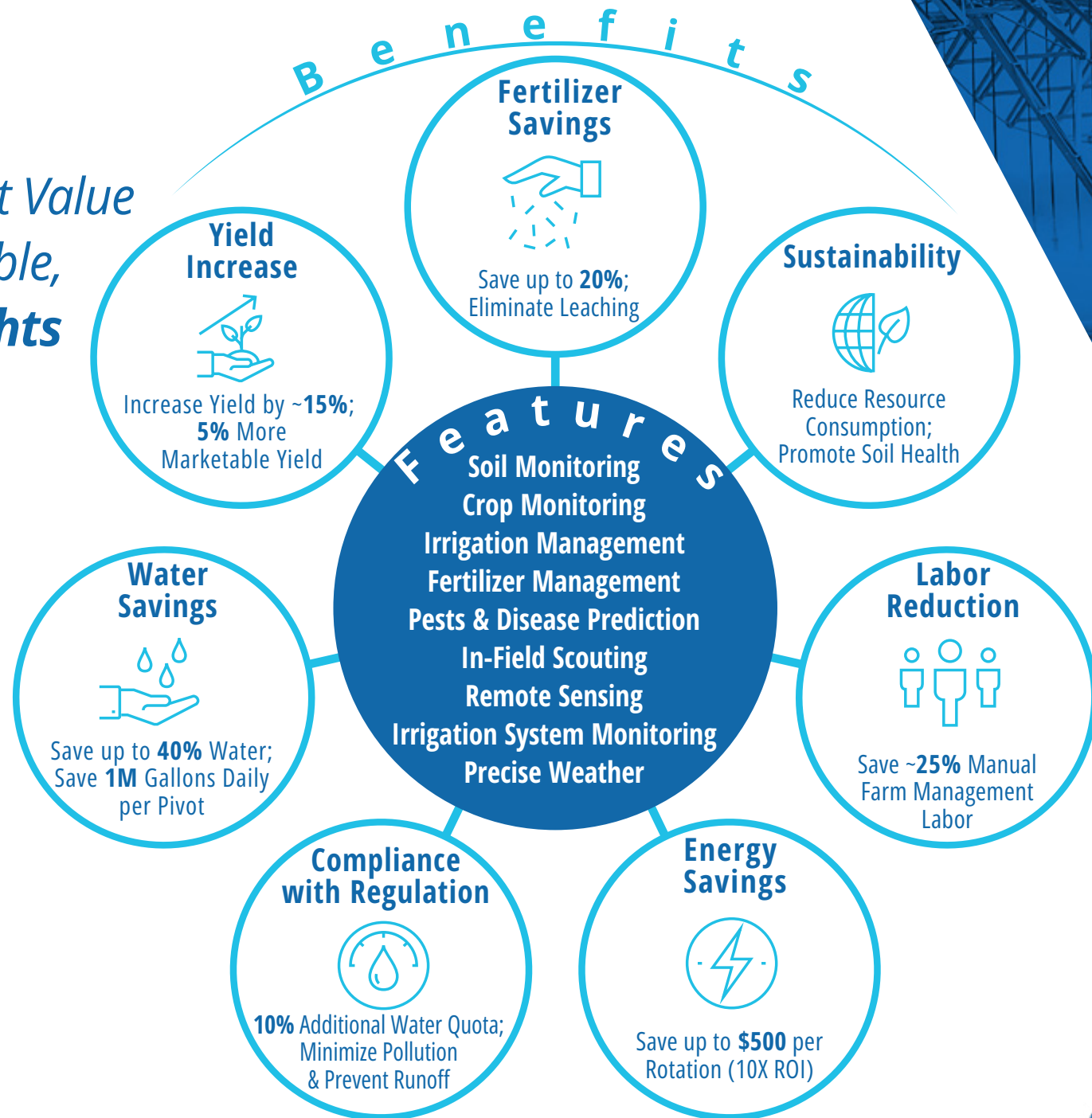
The CropX software integrates additional field data such as location, soil type, topography and crop models with remote sensing data such as precise weather and Satellite imaging.

The data and machine learning based actionable insights can help boost crop yield, save on inputs such as water, fertilizers, energy and labour, as well as the ability to be in compliance with environmental regulation. These insights can be accessed by farmers from any mobile device.

CropX has a strong, professional management team with experience in technology, innovation, agronomy and start-up company management, and is backed by world-leading strategic partners and investors, such as *Finistere, Sumitomo Corporation, Innovation-Endeavors, OurCrowd, Germin8 Ventures, Greensoil Investment, Bosch, Flex, Armada* and others.

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Delivering Instant Value Through Actionable, *Impactful Insights*

Benefits

Features
**Soil Monitoring
Crop Monitoring
Irrigation Management
Fertilizer Management
Pests & Disease Prediction
In-Field Scouting
Remote Sensing
Irrigation System Monitoring
Precise Weather**

Fertilizer Savings
Save up to **20%**; Eliminate Leaching

Yield Increase
Increase Yield by ~**15%**; **5%** More Marketable Yield

Sustainability
Reduce Resource Consumption; Promote Soil Health

Water Savings
Save up to **40%** Water; Save **1M** Gallons Daily per Pivot

Labor Reduction
Save ~**25%** Manual Farm Management Labor

Compliance with Regulation
10% Additional Water Quota; Minimize Pollution & Prevent Runoff

Energy Savings
Save up to **$500** per Rotation (10X ROI)

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The Only *Scalable Solution*

Most precision Ag companies focus above the ground (i.e. Aerial/satellite imaging). However, by the time a plant starts showing external signs of stress, often the damage has already been done. To close the loop, and help the farmer react in real time, we capture where agriculture really happens – in the ground.

▌ **Our Do-It-Yourself (DIY) simplicity** make us the only scalable solution in practical terms. Most sensors entail pricey, lengthy and complex calibration and installation processes, and often require the involvement of a technician, whereas our sensor could be installed by anyone within 5 minutes, allowing large scale farms deployment over short time periods.

▌ CropX sensors are **wireless** and transmit all data directly to the cloud to be presented on any mobile device. Our tech efficiently collects, packs and transmits data even in areas with limited cellular coverage. For areas with no coverage we have developed models with **satellite connectivity and LoRaWAN connectivity.**

▌ Our sensors are self-sufficient and include a rechargeable Li-Ion battery: After installing, the only time you'll need to be near the sensor is for recharging.

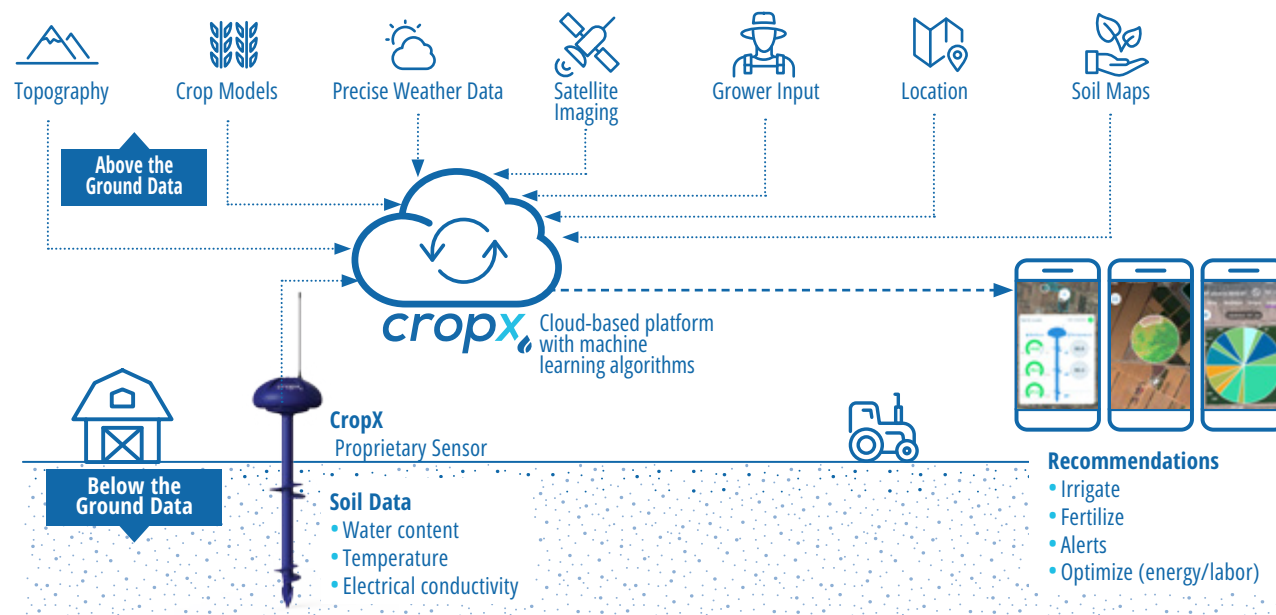▌ Our **price point** allows us to be the only scalable and relevant solution from a market standpoint for all crop types, including commodity crops, and there are no setup costs or dependency on specific irrigation system types or any other infrastructural limitations.

▌ Our insights are provided continuously throughout the growing season. This allows **immediate corrective action**, thus creating significant value.

How Does it Work
An algorithm that leverages both above and below the ground data layers

Topography   Crop Models   Precise Weather Data   Satellite Imaging   Grower Input   Location   Soil Maps

Above the Ground Data

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Cloud-based platform with machine learning algorithms

Below the Ground Data

CropX Proprietary Sensor

Soil Data
• Water content
• Temperature
• Electrical conductivity

Recommendations
• Irrigate
• Fertilize
• Alerts
• Optimize (energy/labor)

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Selected *Features*

Irrigation Management

▐ The CropX app helps the user figure out **exactly** how much to irrigate the field by providing an adaptive irrigation prescription that can be fed into the irrigation system (currently supporting central and lateral pivots as well as drip and sub-drip irrigation systems).

▐ The irrigation prescription **constantly adapts** to the changing conditions of the soil and weather, based on the user's irrigation type, soil type and texture, crop type and variety, precise weather information and more.

▐ **Automatic irrigation management,** from simple on/off control to **full VRI**, by factoring in thousands of data points from previous cases will eventually **reduce manual labor** and **improve the decision-making** process.

▐ In a recent experiment conducted in an Alfalfa field in Arizona, **CropX managed to save 40% of the water**, after assuming control of the pivot irrigation system, and automatically generating an adaptive variable rate irrigation prescription, by factoring in thousand of data points from previous cases.

Crop Protection and Crop Management
Selection of a crop type from a list feeds into crop models, which along with soil moisture, weather data and aerial imagery are used to predict crop water & nutrient needs and expected growth:

▐ **Optimal planting & harvest date** by integrating crop models with satellite imagery and entered sowing dates.

▐ **Crop-specific recommendations,** adjusted to crop growth stage, by combining analyzed root depth with satellite imaging and specific crop protocol.

▐ By analyzing crop growth against known crop models, we can detect any deviation from such baseline, and **identify early-stage field variability** and non-uniformity of crop growth and alert the user accordingly.

▐ Users can divide their fields into multiple zones, with different crop type planted in each zone.

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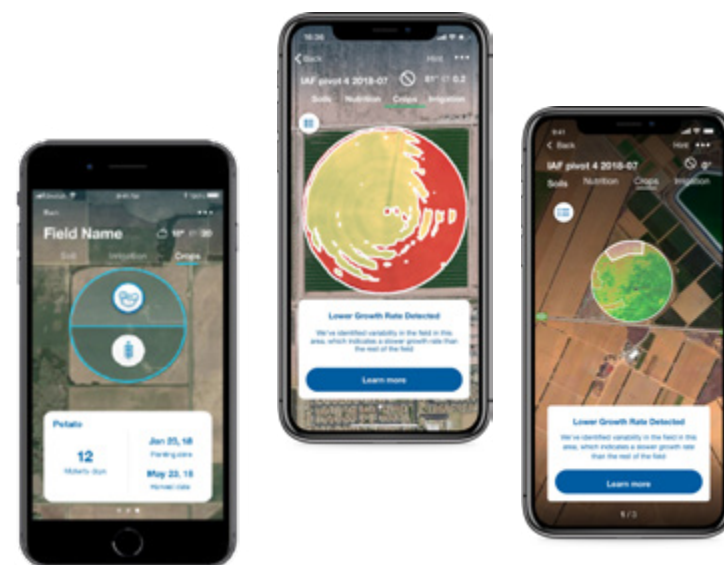
Selected *Features* (continued)

Nitrogen Management (under development)

❚ Machine learning algorithms analyze soil moisture and EC integrated with elevation maps, crop models, satellite imagery and weather forecasts to map nutrient distribution across the field and to create **zone-specific nitrogen application recommendations.**
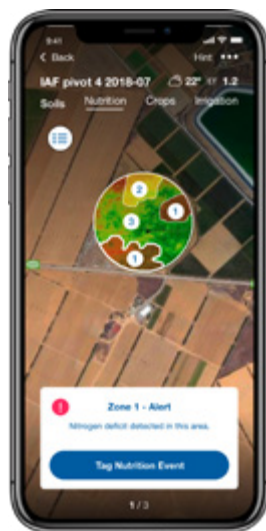
❚ **Nutrien Application Schedule** can be set to recommend when to apply fertilizers, by combining specific fertilizer model with temperature readings, weather forecast and user's input. This can help prevent the unnecessary volatilization of nutrients caused by application in above-the-threshold temperatures.

❚ **Nutrient Management**, enabled by monitoring below the root zone for leeching, prevents the contamination of groundwater and alerts if additional irrigation is needed.

Real-Time Soil Sensing

❚ Volumetric water content (VWC, %), soil temperature and electrical conductivity (EC) are measured continuously, the data can be easily downloaded to an excel spreadsheet for further manipulation.

❚ Water management range can be set to any threshold, for each depth separately, and alarms and notifications can be set (i.e. notification when VWC drops below a certain threshold).

❚ **Continuous measurement** in between sensors' depths, and even above and below them, where no physical sensor exists, allows monitoring of exact root depth, surface runoff, leeching and more.

❚ **'Virtual sensor'** fills the gap in between CropX sensors, predicting moisture levels at any location in the field with high accuracy.

❚ Once the CropX platform identifies the field's irrigation regime and patterns, it can detect faults, as broken pipe or clogged nozzle cause fluctuations from said pattern.

These are all ever-evolving features – The more data points we acquire, the smarter our engine becomes.
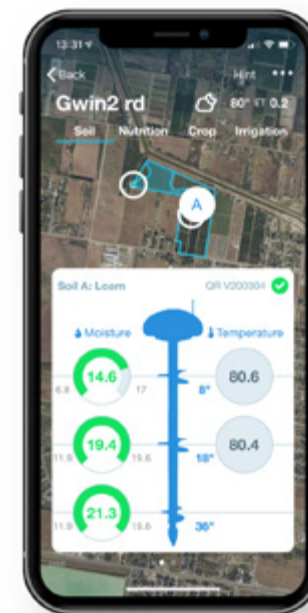
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Revolutionizing Soil *Sensing*

The foundation to enabling the benefits of the CropX System is the CropX Soil Sensor – The result of 4 years of development (a continuously ongoing effort). It includes both the soil sensing components, computing and communication components and energy, all in an easy to use package. No more need for separate data loggers, modems or power source!

Each CropX soil sensor collects moisture, temperature and EC at two/three depths (depending on HW's version) – 8",18" & 36" (20,45 & 90 cm) every 30 min and transmits to the CropX cloud at 12-hr intervals. Both intervals can be remotely configured and modified according to your needs.

Our sensor uses the **ADR** (*Amplitude Domain Reflectometry*) method with proprietary modifications. ADR uses high frequencies to measures the soil electrical impedance which, in high frequencies, is dominated by the dielectric coefficient which in turn is dominated by the amount of water.

Our **unique patent-pending** spiral design allows our sensor to avoid disturbing the soil while being installed, thus preventing false measurements affected by *preferential flow*, like in the case of most other commercial sensors, as shown by our computer simulations.

To eliminate the need of soil-specific per-sensor calibration (as it is a very expensive and time-consuming operation), CropX uses algorithms to remotely and automatically calibrate each sensor per installation, by analyzing the soil-water behavior and calibrating the measured electrical impedance to specific field capacity (FC) and wilting point (WP), thus identifying the current soil moisture in proportion to FC & WP.

This process is repeated over time, enabling the calibration to adapt to current field conditions, as these conditions typically change over time (due to different farm and crop activities affecting soil compactness and other factors).

The most important validation comes from our customers. A *recent study* conducted and published by *Beck's Hybrids* concluded: "CropX-based irrigation produced 15%-25% more yield compared to manual irrigation".

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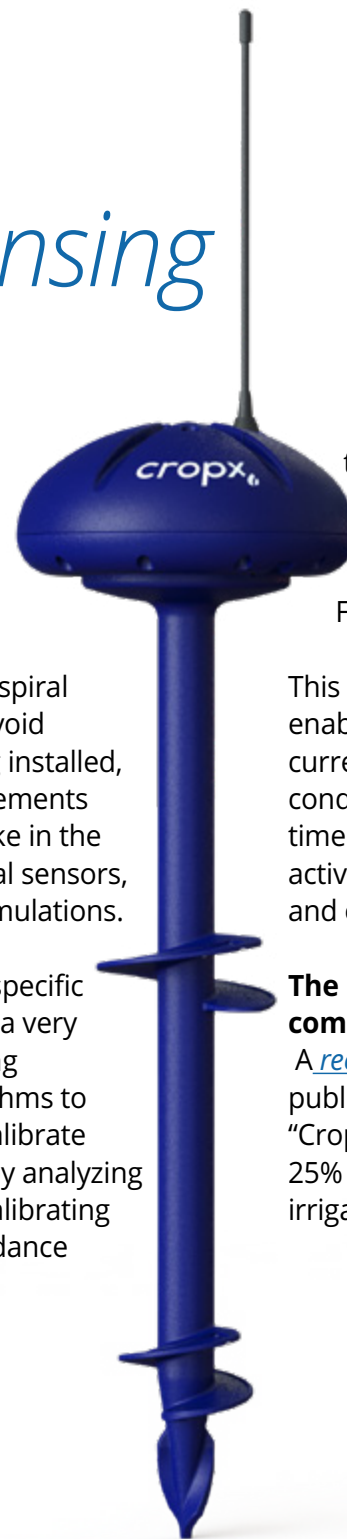
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Our **Big-Data** Vision

Our value proposition goes beyond the individual field, and with the right install base CropX becomes a big-data platform for organizations across the value chain offering valuable insights for R&D, marketing, trading, logistics, compliance and many other strategic use-cases.

Therefore, our main go-to-market focus is to build commercial collaboration with strategic accounts in sectors such as agrochemicals, government agencies, large ag-distributors, corporate farming, trading, agri-businesses, food manufacturing and others.

We are looking to achieve ubiquitous deployment while collecting millions of quality data points, with the objective of offering big data, machine learning algorithm-based insights. This allows us to do much more than with a single-point measurement.

Awards and Global Recognition

Red Herring Top 100 Global Winners 2016 Global Winners 2018 Europe Winners 2018

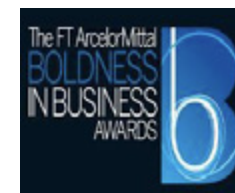**Edison best new product award winners - Water conservation 2017**

THRIVE AgTech Top 50 2018 2019

Forbes - The 25 Most Innovative Ag-Tech Start-ups 2017

Boldness in Business Awards - Technology Award 2017

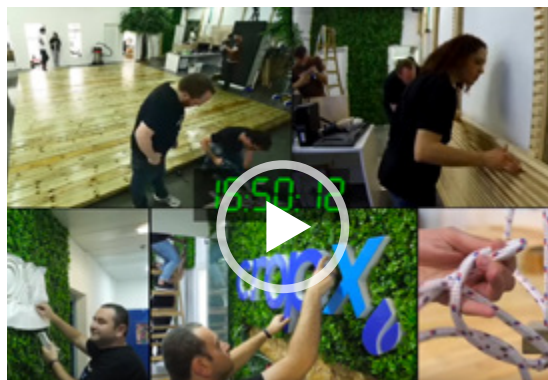**The Atlas Award 2017**

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Video Gallery

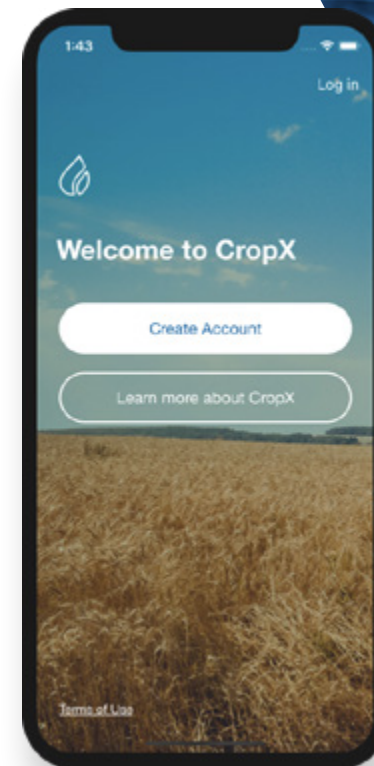**CropX's presentation at the AIPAC conference in front of 18,000 people!**

CropX's product video

CropX's Recruiting Video

CropX's employees renovated their office in just one day

Welcome to CropX

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