REVOLUTIONISING AGRICULTURE WITH PRECISION AUTOMATION:

HARNESSING THE POWER OF OKDO & ARDUINO PRO TECHNOLOGY

6TH APRIL 2023

4PM – 5PM BST

REVOLUTIONISING AGRICULTURE WITH PRECISION AUTOMATION

PRESENTING TODAY

RICHARD CURTIN

CO-FOUNDER AND CTO

OKDO

ANDREA RICHETTA

HEAD OF PRO CUSTOMER SUCCESS

ARDUINO

ROBERT WOODS

DIRECTOR

AGRIBUSINESS

REVOLUTIONISING AGRICULTURE WITH PRECISION AUTOMATION

ABOUT OKdo™

At OKdo, we believe in ordinary people achieving extraordinary things.

Our mission is to empower innovators to create cutting-edge solutions.

We offer software, development support, and manufacturing services to turn ideas into reality. Expect problem-solving services at every stage of the design cycle.

Let's design the world together.

GLOBAL FAE TEAM OF CUSTOMER CENTRIC EXPERTS

£50M ON HAND INVENTORY

<1M CUSTOMER COMMUNITY

BROAD CHOICE OF PRODUCTS WITH DIRECT FRANCHISES

PART OF A FTSE 100 COMPANY

RS

INNOVATION AT THE HEART OF THE BUSINESS

WHAT WE OFFER

DESIGN

MANUFACTURE

DISTRIBUTE

ENGAGE

SCALE

HELLO!

RICHARD CURTIN - CTO & CO- FOUNDER

okdo™

5 SMART FARMING TECHNOLOGIES TRANSFORMING AGRICULTURE

SENSORS

Agricultural sensors and the data that they capture are proving invaluable for farmers. These blend traditional farming methods with IoT to provide a range of functions, including monitoring moisture and temperature levels. The sensors capture information which is transmitted wirelessly, allowing farmers to see at a glance any areas that need their attention.

ROBOTICS

There are different applications for robotics in agriculture. One of the main ways in which this is being done is via machinery. While the heavy-duty machines will always have a place in farming, agricultural robotics can be programmed to do everything from simple pick-and-pack tasks to crop monitoring and wide-scale harvesting.

DRONES

Unmanned arial vehicles (UAVs) – or drones – are helping farmers to plan ahead. These are smart farming technologies that allow farmers to gather data in real-time to assess their land, enhancing decision-making and boosting productivity. Some of the main uses for drones in agriculture include surveying and mapping out where crops can be planted, running checks on crop health and flagging any signs of disease.

CLOUD SOFTWARE

Agriculture cloud computing goes hand-in-hand with sensors and data captured by drones and robotics. However, it’s crucial to recognise it as a standalone digital form of smart farming tech as it’s essential for assimilating the data obtained.

Cloud-based software helps farmers manage output, forecast production and manage quality, as well as empowering government agricultural decision-making.

SECURITY TECHNOLOGIES

As well as practical farming solutions, there are other forms of smart tech that can be used on farms. One of these is automated security solutions.

By creating a more digitally advanced security setup, farmers protect their land. Without measures in place, a security breach could disrupt food supply chains and affect other types of output, such as dairy supplies and livestock.

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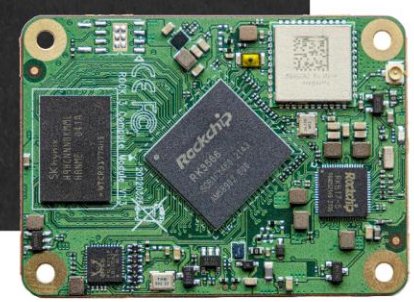
HOW CAN SBCS BE USED IN AGRICULTURAL AUTOMATION?

IMPROVED EFFICIENCY, RELIABILITY, USER EXPERIENCE,
ENERGY MANAGEMENT, AND REMOTE MONITORING.

- **DATA COLLECTION** — SBCs collect data on environmental factors for precision agriculture decisions like irrigation and fertilisation.
- **MONITORING** — SBCs enable remote monitoring of crop health, disease, and pest detection for early corrective action, diagnostics, and software updates.
- **REMOTE MANAGEMENT** — SBCs enable remote management of EV charging infrastructure, including diagnostics, software updates, and troubleshooting without on-site technicians.
- **CROP OPTIMISATION** — SBCs optimise crop growth by adjusting temperature and humidity in greenhouses to create the ideal growing environment for specific crops.
- **AUTOMATION** — SBCs automate farm processes like irrigation, fertilisation, and pest control, reducing manual labour, increasing efficiency, and lowering error risks.



REVOLUTIONISING AGRICULTURE WITH PRECISION AUTOMATION

WHAT MAKES SBCS THE RIGHT CHOICE?

TIME TO MARKET

SBCs accelerate project implementation with established HW/SW baselines and pre-certifications for CE/FCC, supporting faster go-to-market strategies.

PERFORMANCE VS COST

SBCs offer the best performance at the lowest price points by aggregating global volumes.

ENGINEERING EFFICIENCIES

SBCs provide tested HW & SW for easy integration into end applications, allowing engineers and developers to quickly change the core platform for greater efficiency.

ECOSYSTEM

SBCs enable application scaling and expansion through an ecosystem of HATs, shields, and carrier boards.

SUPPLY CHAIN OPTIMISATION

OKdo's SBC BOM's supply chain is cost-optimised, includes second source components, and provides global manufacturing solutions to meet customer needs while mitigating global economic uncertainty/challenges.

SCALABILITY

SBCs offer a path to Compute Modules (CM) or System on Modules (SoM), enabling cost and performance optimis--ation of the application as volume grows. The next step would be to design directly on the Silicon vendor's System on Chip (SoC) for further scalability.

WE WORK WITH LEADING BRANDS

POLYHEX

NXP

Rockchip

Infineon

NVIDIA

LAIIER®

Coral

okdo™

THANK YOU!

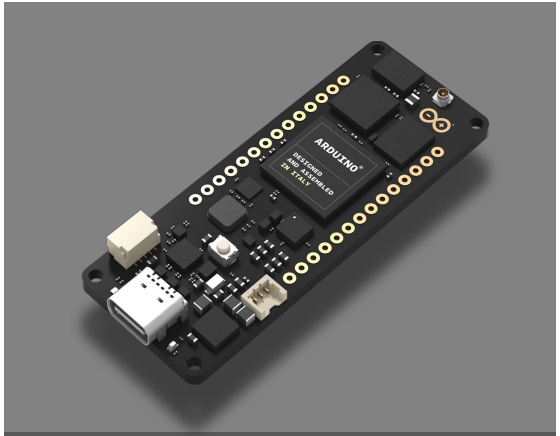
IF YOU WOULD LIKE TO LEARN MORE, REACH OUT TO ONE OF OUR EXPERTS

SUPPORT@OKDO.COM

Arduino Pro
Smart agritech

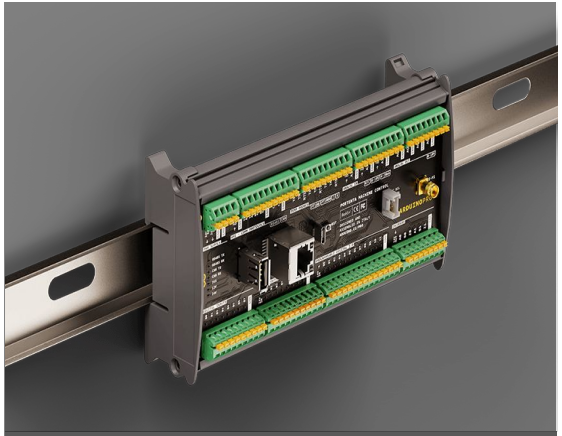
Andrea Richetta
Head of Pro Customer Success Team

Arduino PRO: Edge IoT technology



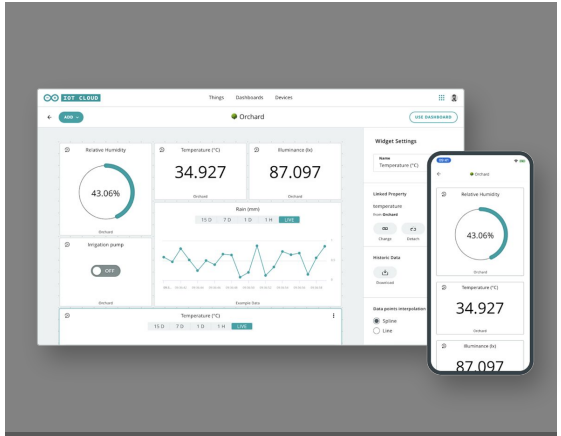
System on Modules (SOM)

High-performance / low power / secure electronics building blocks



Turnkey Solutions

Products tailored to vertical applications



Arduino Cloud

Device Management / OTA (Embedded and Linux) , Low Code Development framework, Device connectivity, data management APIs)

Portenta H7

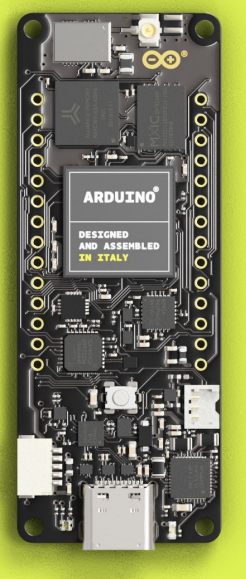
Overview

- Two best-in-class microcontrollers in one
- Onboard Wireless modules
- Support high-level programming languages
- Security over time
- High expandability

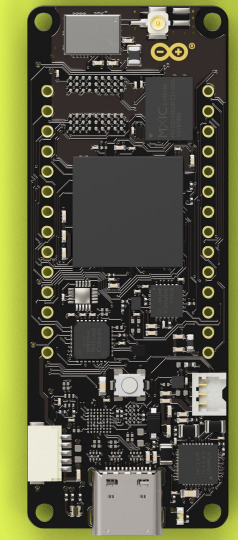
Use cases

- Industrial machinery
- Laboratory equipment
- Computer vision
- PLCs
- Robotics controller

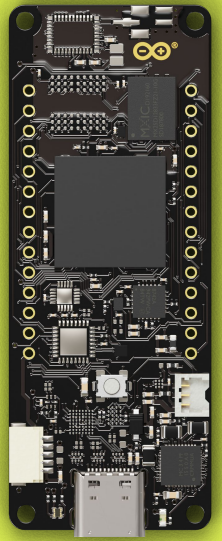
Three Portenta H7 versions available



Portenta H7



Portenta H7 Lite Connected



Portenta H7 Lite

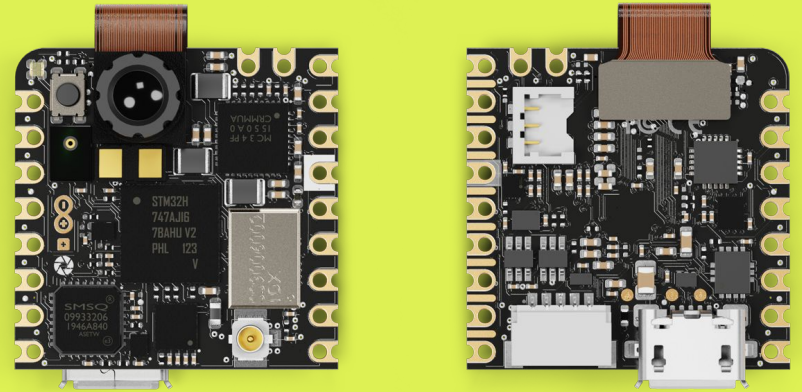
Nicla Vision

Overview

- Image processing with 2MP color camera
- Tiny size packed with features
- Industrial grade sensing
- Connected sensor node

Use cases

- Automated quality checks
- Multi-sensor preventive maintenance
- Detection of health and safety devices (PPE)
- Ready-to use machine vision prototyping solution



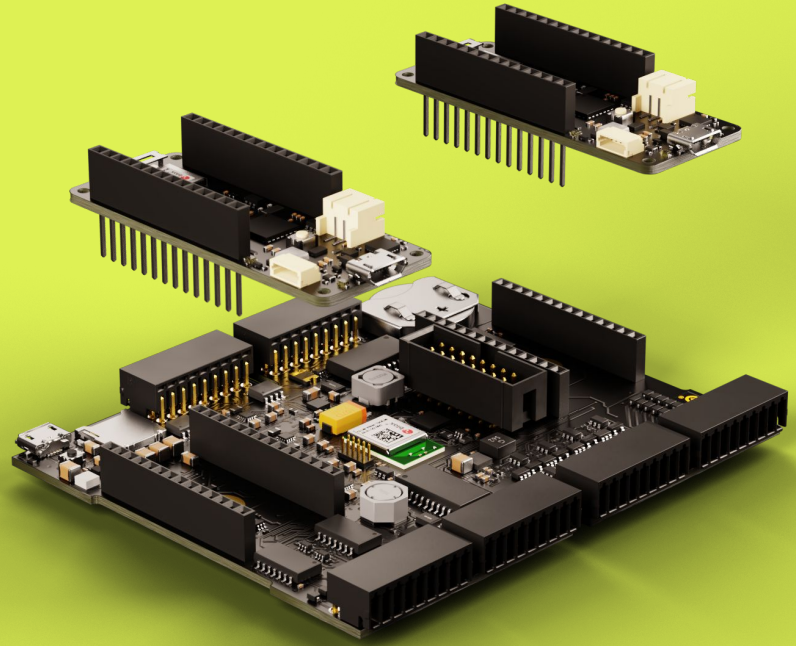
Edge Control

Overview

- Agritech , out/ indoor usage
- Solar panel power
- Multiple connectivity options
- Remote areas installation

Use cases

- Automated Greenhouses
- Hydroponics/Aquaponics
- Mushroom Cultivation
- Fertilization/Irrigation
- Real-time weather monitoring
- Energy consumption monitoring



Example of a typical application for a solution including two Arduino MKR boards.

WisGate Edge gateways

Overview

- LoRaWAN® connectivity
- Indoor and outdoor solutions
  - Indoor: WisGate Edge Lite 2
  - Outdoor: WisGate Edge PRO

Use cases

- Smart Energy Management
- Remote City Security
- Gas Metering
- Remote Kiosk
- Crop and Irrigation Management

- **WisGate Edge PRO**
- **WisGate Edge Lite 2**

WisGate Edge PRO on the left and WisGate Edge Lite 2 on the right

MESHED FARMING

Prevent unuseful pest chemical usage

AI assisted Farming

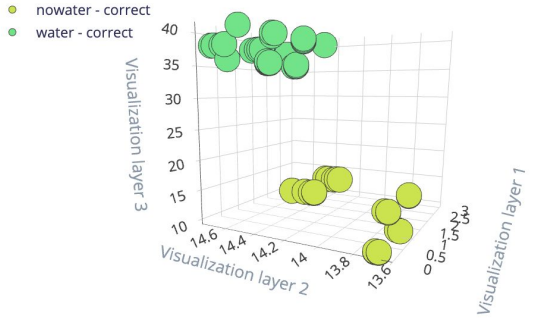
Enriched data

Model testing results

ACCURACY
100.00%

	NOWATER	WATER	UNCERTAIN
NOWATER	100%	0%	0%
WATER	0%	100%	0%
F1 SCORE	1.00	1.00	

Feature explorer



SOIL MONITORING

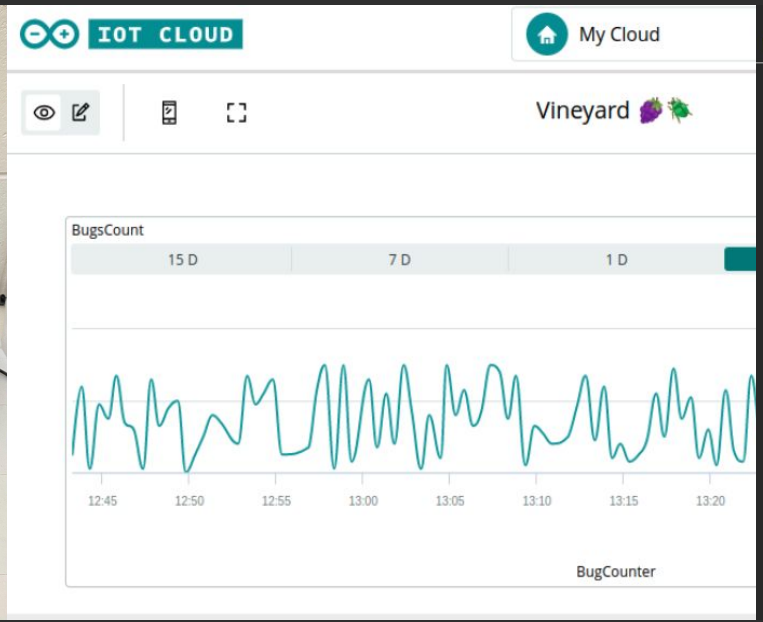
Traditional + Control / command solution

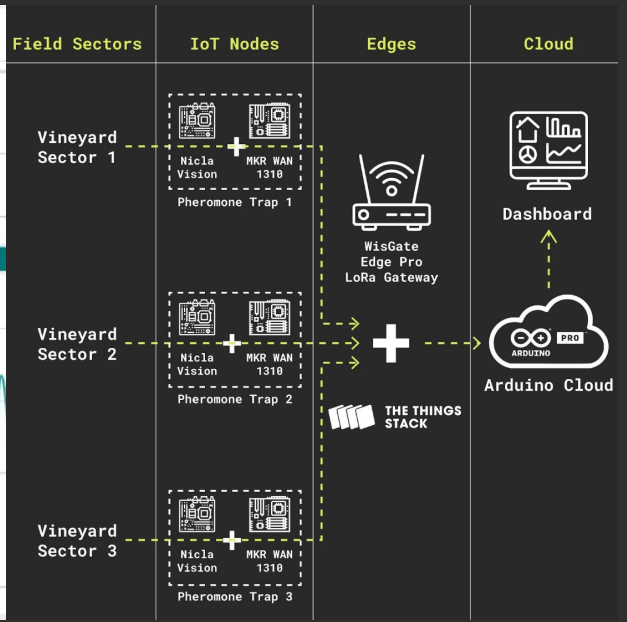
New Business opportunity

Hardware as a product

Vineyard Pest Monitoring

Smart vision recognition





Thank you

Andrea Richetta
Head of Pro Customer Success Team

Precision Agriculture

ROBERT WOODS

What is ‘Precision Agriculture’

Challenges in running a farm.

WEATHER

Climate changes and temperature/rainfall variability

FARM INPUTS

Costs continue to rise for buying farm inputs; agriculture products are commodities. Famers have little control over prices they receive.

WATER

Water availability will be the 'new oil' of future.

LAND

Pressure on land for farming due to increasing populations

Farm Costs

INPUTS

Fertilizer, seed, chemicals, fuel, electricity,

LABOUR

Declining farm labour force, family members leaving farming

MACHINERY

Tractors, spraying, harvesting, tillage, sowing etc

TRANSPORT /STORAGE

Grain storage and transport to market

SOLUTION: Precision Farming

What does that mean?

Improving crop yields and assisting management decisions using high technology sensor and analysis tools.

Sustainable Farming Practices

IMPACT ON FARMING INDUSTRY

PRODUCT USAGE

Reduciton in amount of chemicals and fertilizer used

Cost savings

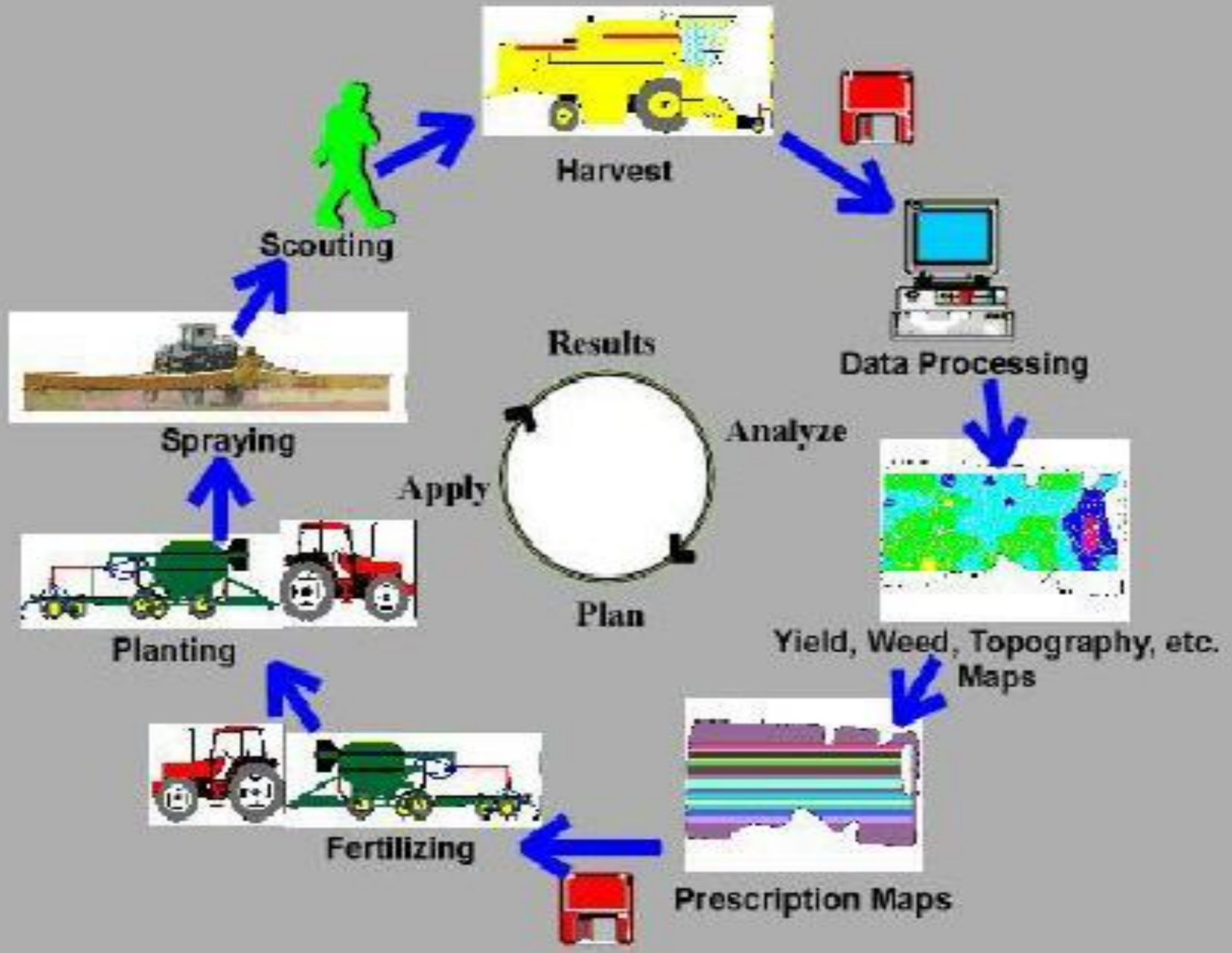
IDENTIFCATION OF KEY ‘SIGNS’

Crop ‘stress’ due to insect and deficineces can be indeftified

YIELD INCREASES

Provides ‘best’ growing opportunities

Seeding rates and types of seed identified and used



Internet based data collection tools are used to collect and record.

GPS, Drones, satellites etc all assist in the process.

Questions Please

THANK YOU