



Indoor farming, digitization and big data
Investing & partnering with result driven innovative companies

BUHLER

ROYAL
COSUN

CROP

**INNOVATION
& BUSINESS**

April 14 - 16, 2019 | Amsterdam

Nouryon

ICOS
CAPITAL

Icos Capital invests in early stage in collaborative partnership with sector specialist corporations

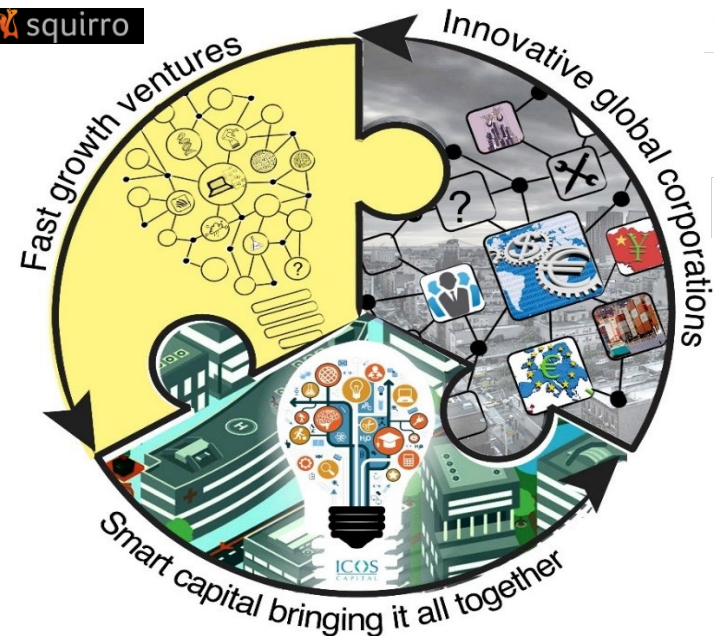
Leading European team with sector and market focus since 2006 with three funds, AUM €50 M in 15 companies in Benelux & DACH

Stable partnership with > 75 years cumulative VC/PE experience with strong performance track record of strong returns with **€150 M invested across 61 investments**

Icos III, € 50 M, smart production systems fund focused on enabling software & technologies for Agrifood & (bio) chem

Icos III will invest in 10 scale up companies

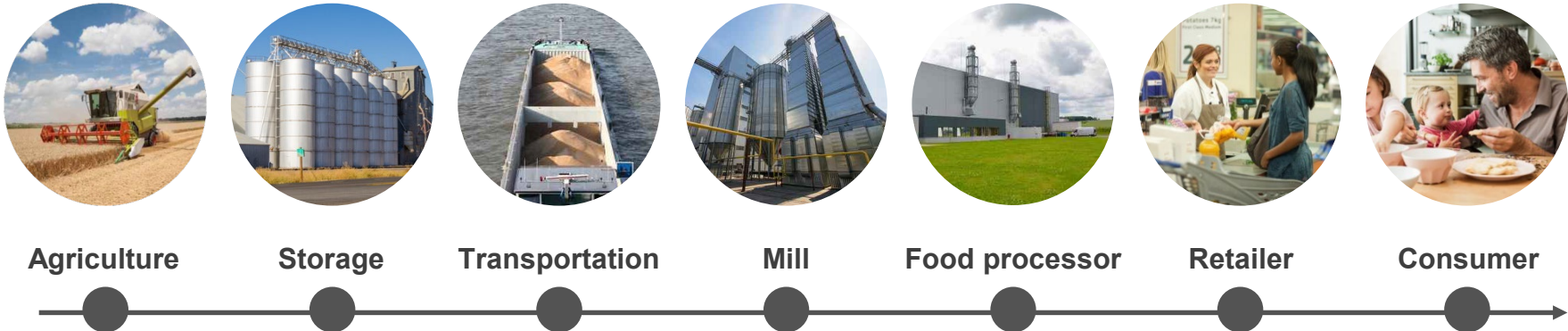
Registered at Dutch AFM, EuVECA passport



**Collaborative partnership
Capital, scale-up corporations &
innovations**

Investing digitization propositions across Agrifood value chain

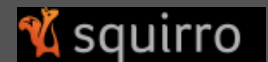
where each proposition is engaging commercially with corporate partners



Precision agriculture & crop optimization solutions



Value chain transparency & supply chain (origin, authenticity, food security)



Resource efficiency – reduction of energy and waste by 30%

Predictive analytics & process tech solution

Gamaya is the leading crop intelligence firm focused on Agri tech intelligent solutions



www.gamaya.com
yosef.akhtman@gamaya.com

Forbes

"Gamaya is one of the 4 European AgTech startups with a potential to become a \$1 billion dollar company"

BUSINESS INSIDER

"Gamaya is one of the 12 hottest startups in Switzerland based on the amount raised, headcount, and developed technology"

FORTUNE

"Gamaya is changing farming with drones and artificial intelligence"

SEF.AWARD 2017
 SwissEconomicForum

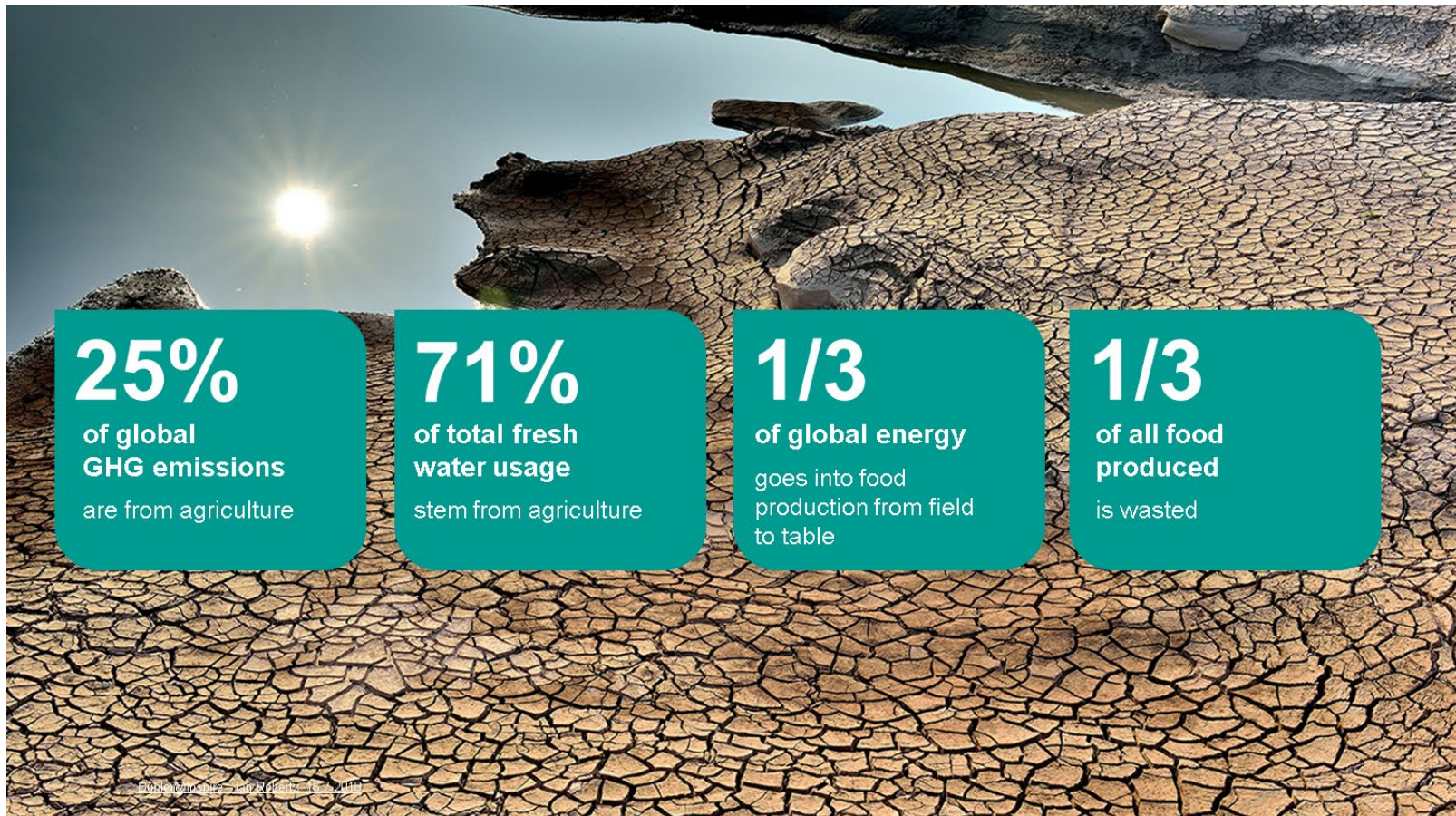
PRIX STRATEGIS HEC
 ESPACE ENTREPRISE

digital
 switzerland

NVIDIA
 INCEPTION AWARD



Macro arguments for investing in Agritech are compelling and well known

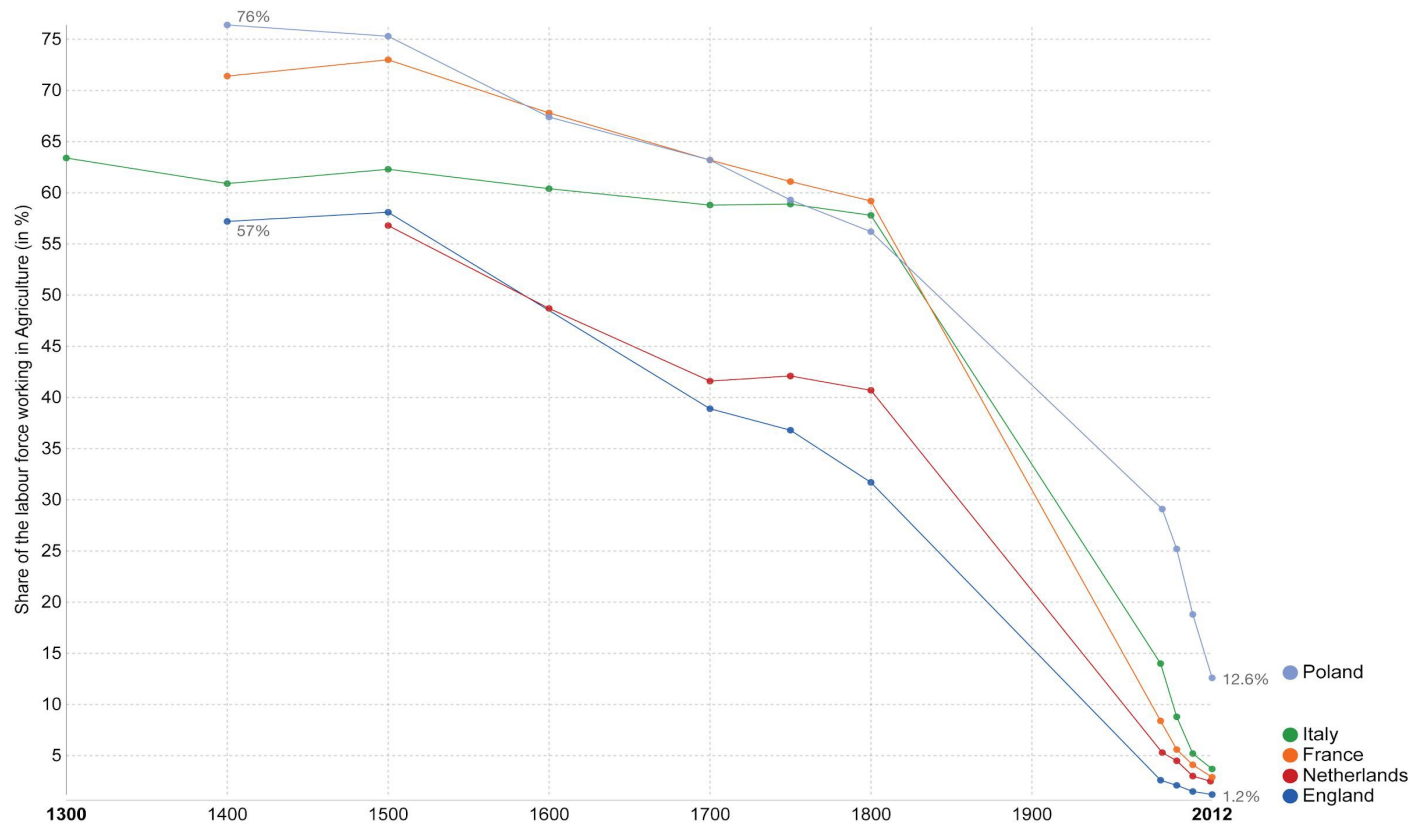


Source: Buhler Group, 2015

Agritech adoption is not new!



Share of the labor force working in agriculture, since 1300 – By Max Roser



Data source: Pre 1800 is from Allen (2000), "Economic Structure and Agricultural Productivity in Europe, 1300-1800". Newer data from the World Bank.

The interactive data visualization is available at OurWorldinData.org. There you find the raw data and more visualizations on this topic.

Licensed under CC-BY-NC-SA by the author Max Roser.

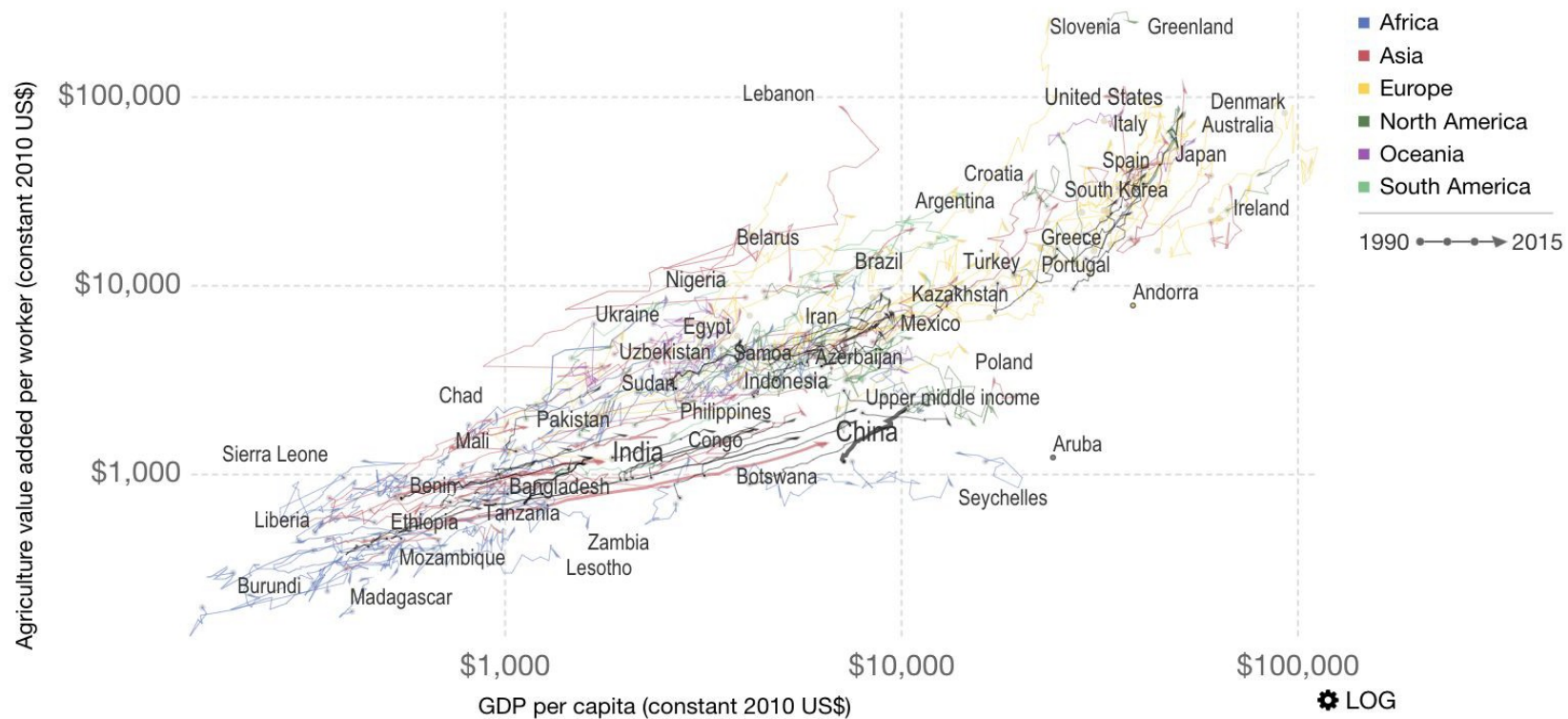
Tech adoption also directly relates growth in economies

Agriculture value added per worker vs. GDP per capita, 1990 to 2015

Agriculture value added per worker versus gross domestic product (GDP) per capita, both measured in constant 2010 US\$. Agriculture value added per worker is a measure of agricultural productivity. It corresponds to the ratio between value added in agriculture (constant 2010 US\$) and number of people employed in agriculture.

⚙ LOG

Our World
in Data



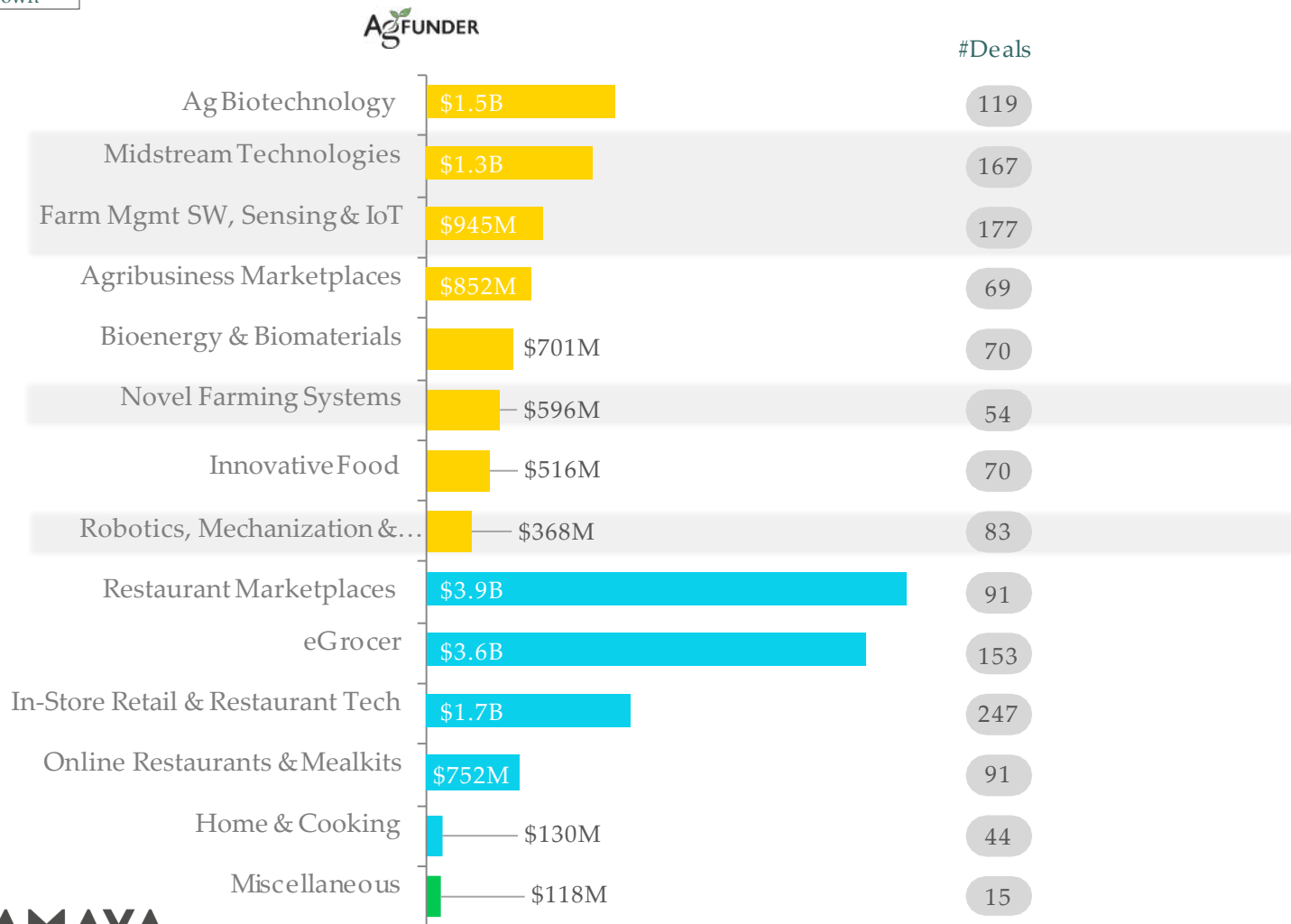
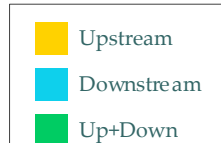
Recent wave of startups shows strong push with digitization as key driver

AG TECH: 100+ TECHNOLOGY COMPANIES CHANGING THE FARM



Agfunder: investment trends

481 deals, \$3.2 B invested in 2018



Gamaya's vision on AI in agriculture

Market (US\$)

100B

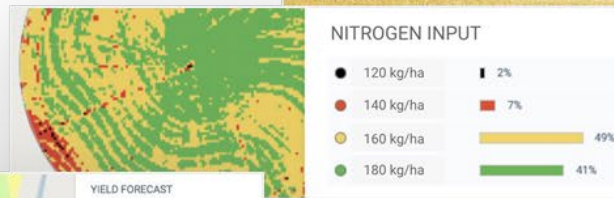
10B

1B

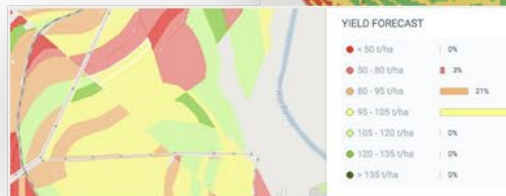
100m



EXECUTIVE AI
Fully automated robotic farm

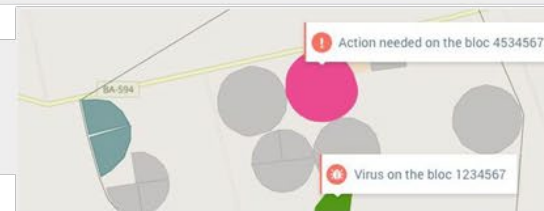


PRESCRIPTIVE AI
Digital agronomy and automated farm management



PREDICTIVE AI
ROI optimisation and risk management

DESCRIPTIVE AI
Improved situational awareness and decision support



2018

2025

2032

2040

year

Gamaya environmental intelligence platform

Holistic approach using multiple data sources and unique capabilities to provide actionable insights

MULTI-SCALE SENSOR FUSION




Satellite
Observations

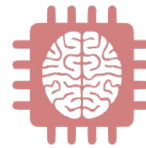


Airborne
Hyperspectral
Imaging*



Weather
Stations


Crop Model and Spectral
Signature Database*



Gamaya AI Engine*

DECISION SUPPORT AND AUTOMATION

Monitoring and
Heuristics



Field
Robotics



Agricultural
Machinery



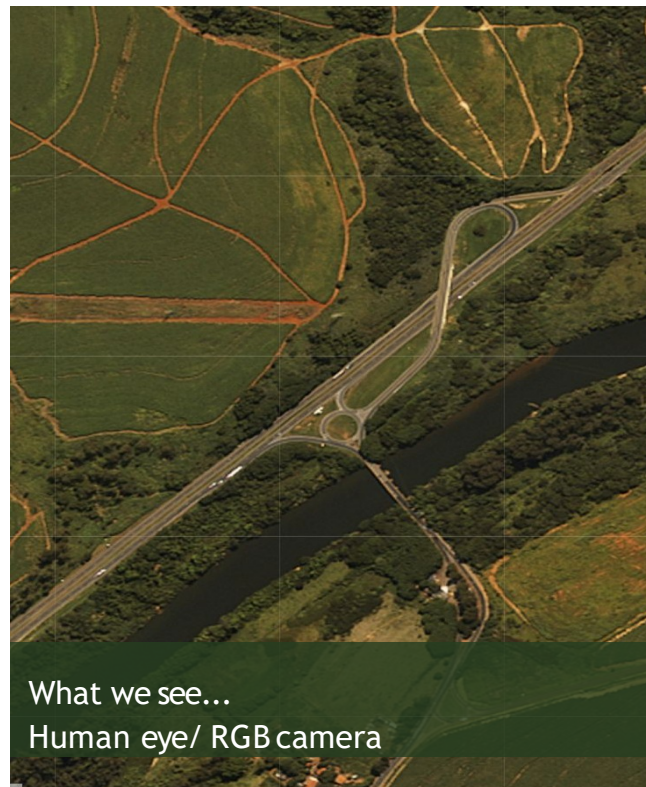
* Proprietary

Hyperspectral imaging delivers more crop intelligence to make decisions

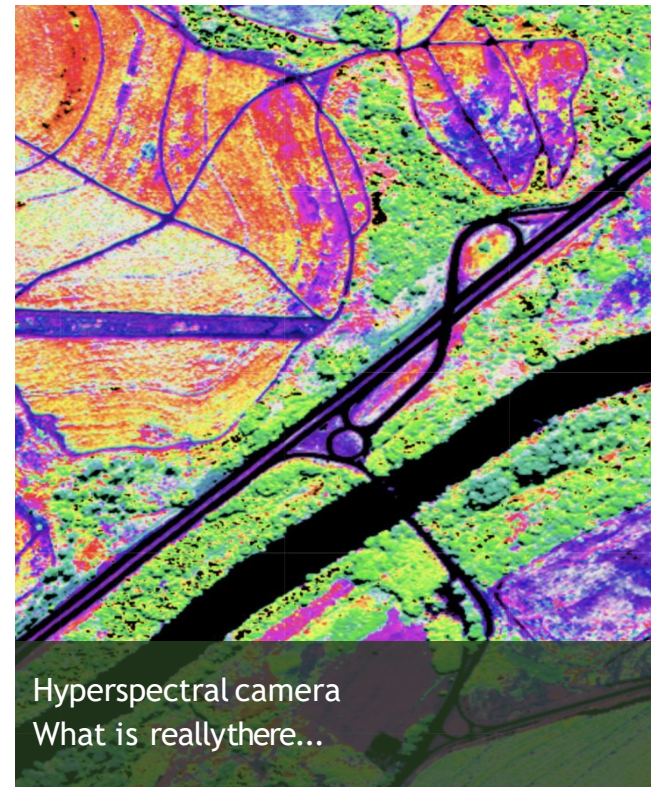
Unique way to connect plant-scale biology with large-scale remote sensing and analytics of crops

The gateway towards AI-driven decision support and process automation in industrial agriculture

Exclusive know-how of Gamaya based on many years of scientific research, as well as extensive portfolio of software/hardware capabilities and IP



What we see...
Human eye/ RGB camera

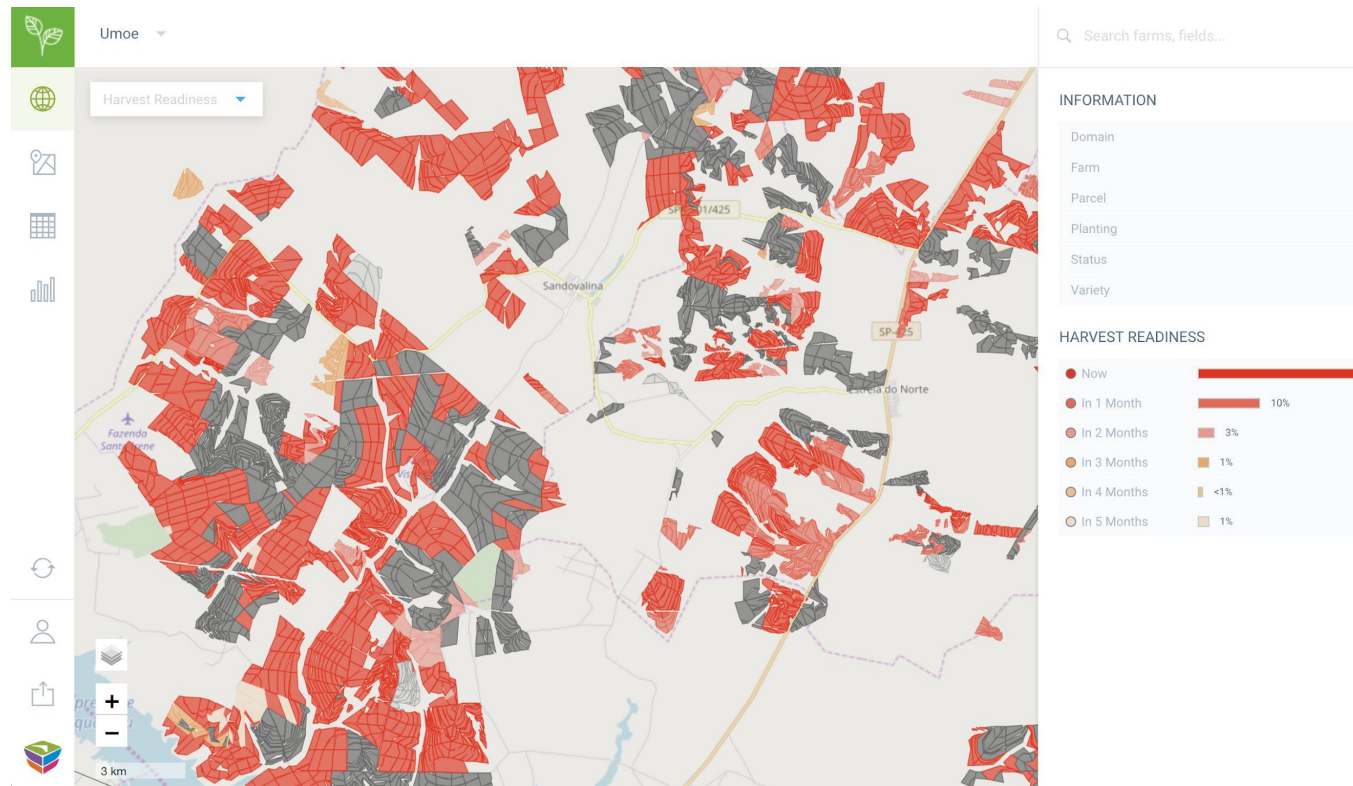


Hyperspectral camera
What is really there...

Sugarcane solution to optimize logistics (example)



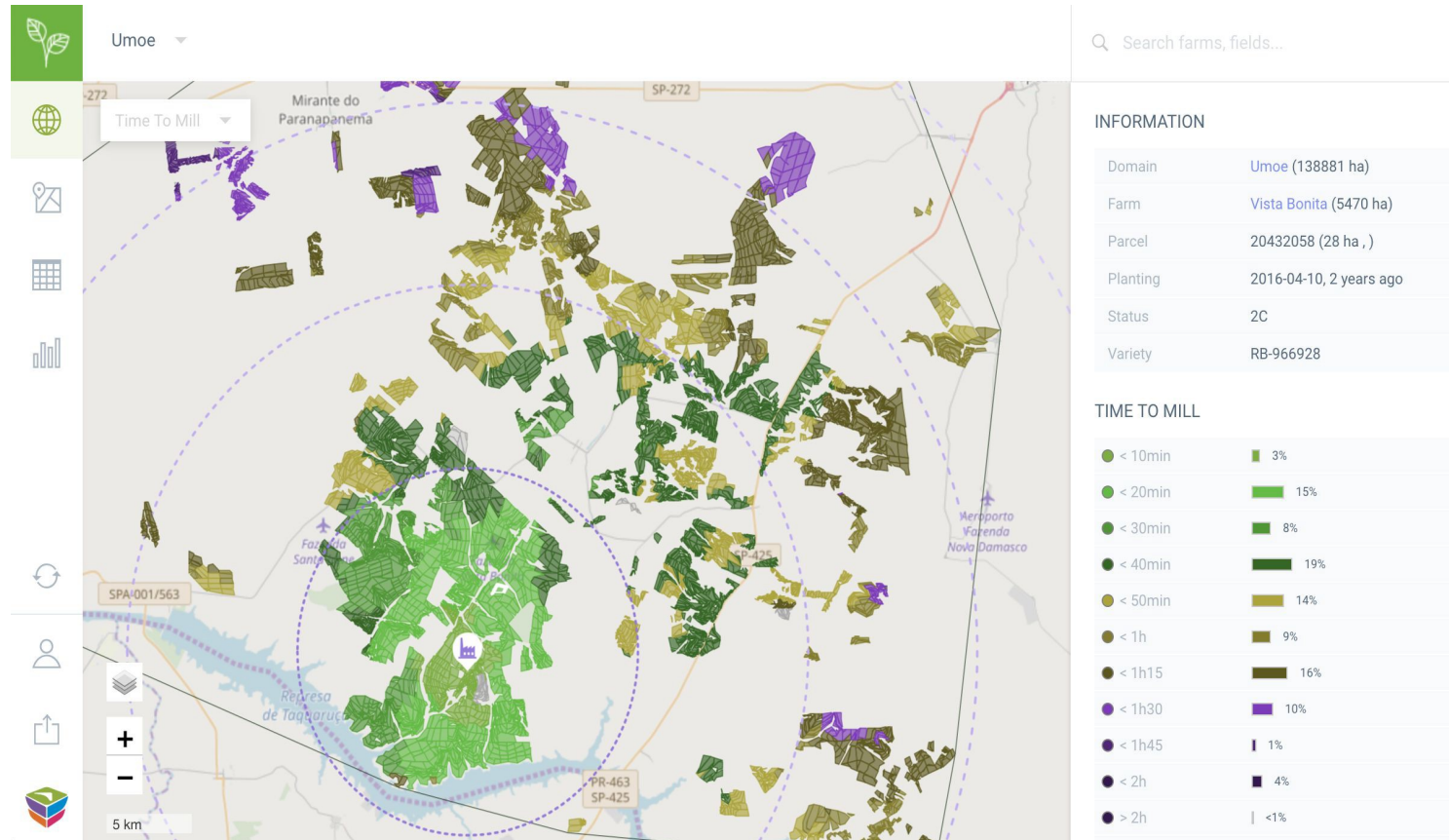
TOTAL SITUATIONAL AWARENESS TO OPTIMIZE LOGISTICS



Sugarcane solutions to optimize logistics (example)



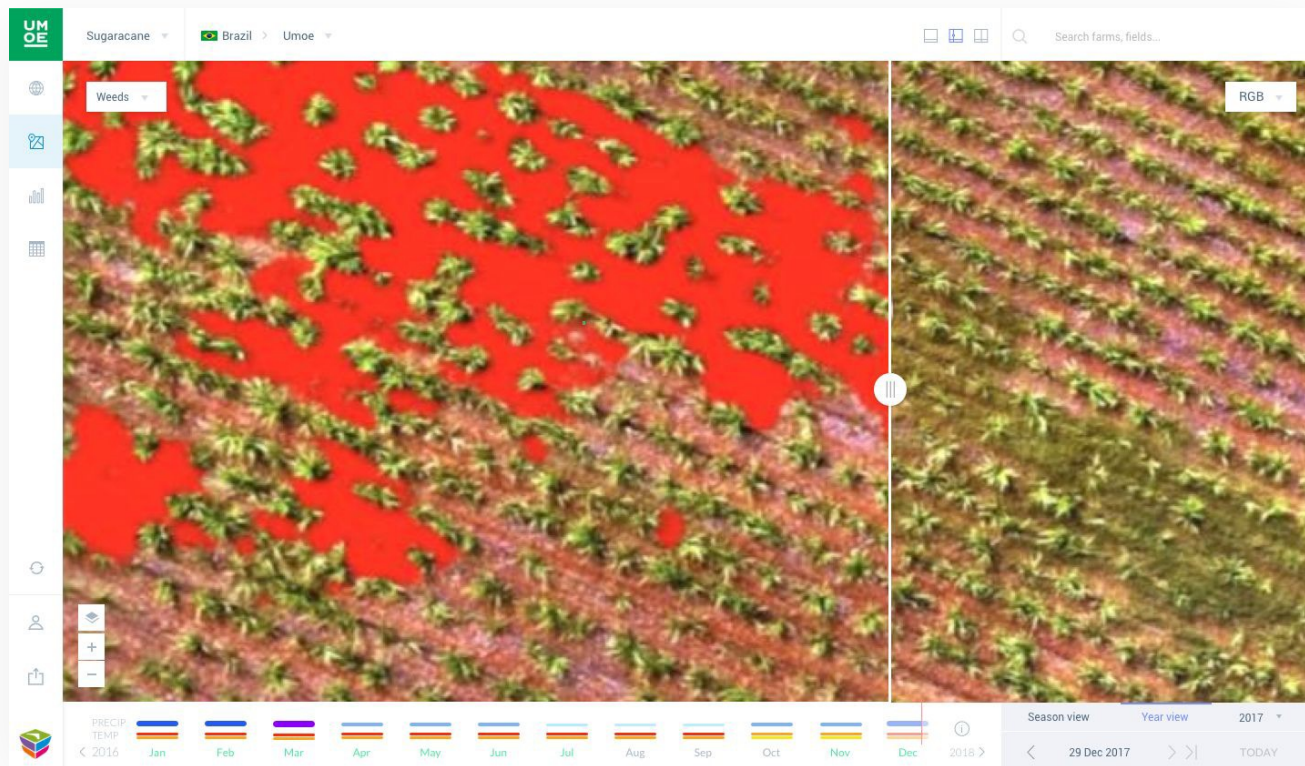
TIME TO MILL TO OPTIMIZE LOGISTICS



Sugarcane solutions for crop intelligence and more precise use of fertilizers (example)



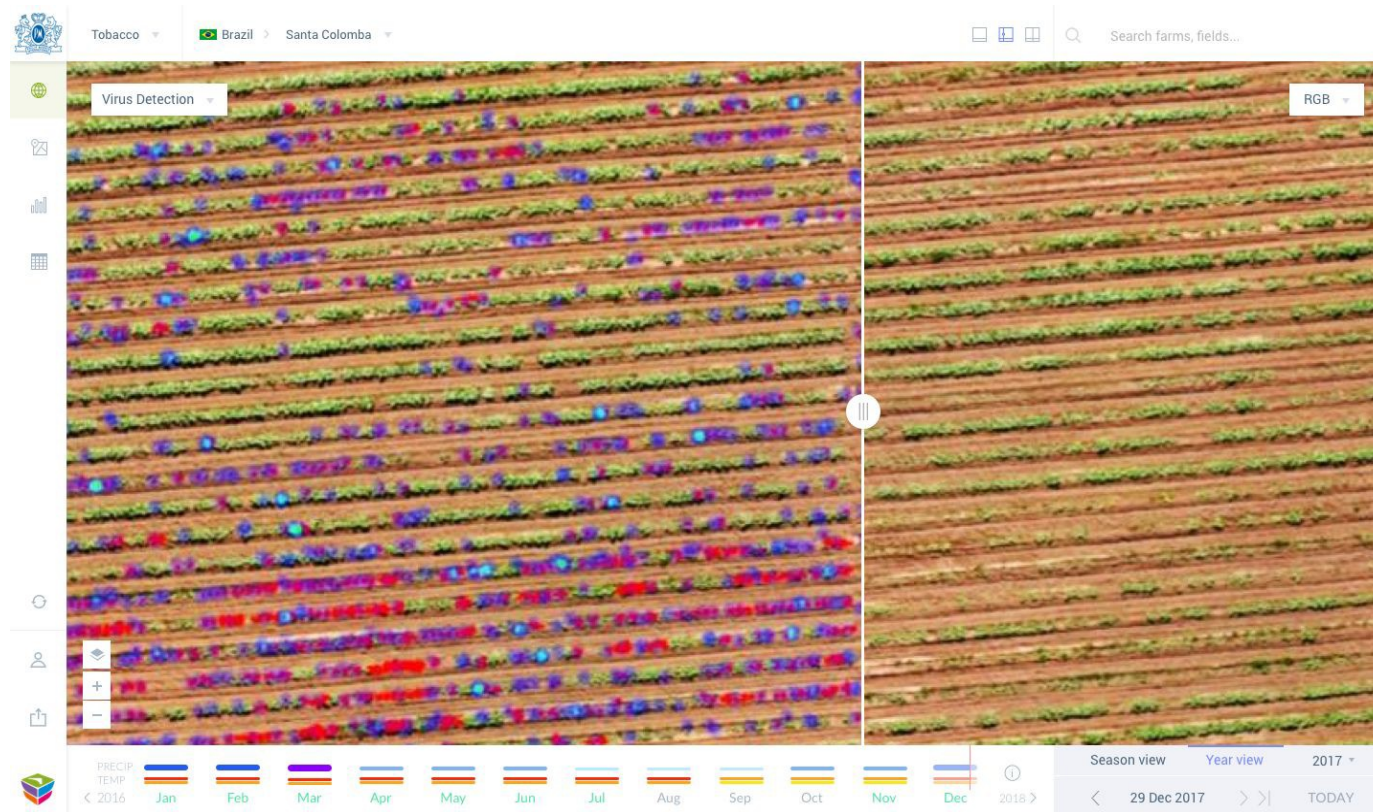
DETECTION OF WEEDS FOR TARGETED HERBICIDE APPLICATION



Tobacco industrial production benefitting from intelligence via hyperspectral and AI insights (example)



DETECTION OF TOBACCO MOSAIC VIRUS TO REDUCE YIELD LOSSES



Business model: Partnerships with major Ag suppliers / producers B2B not B2F

KERNEL

Development of a macronutrients (NPK) delivery optimisation solution in various crops in Ukraine

Kernel is a 2nd largest ag producer in Ukraine with a total land of 600'000 ha

Mahindra *Rise.*

Development of a harvest readiness solution in sugarcane, India

Define an optimum time window for harvest readiness.

syngenta

R&D Crop Protection trials evaluation in Switzerland PoC completed (Corn, sugar beet, soybean)

Development of a soybean crop pest monitoring solution in Brazil initiated in Q4 2018 (on-going)

ADAMA

Development of a new solution to help diagnose nematodes in sugarcane (on-going)

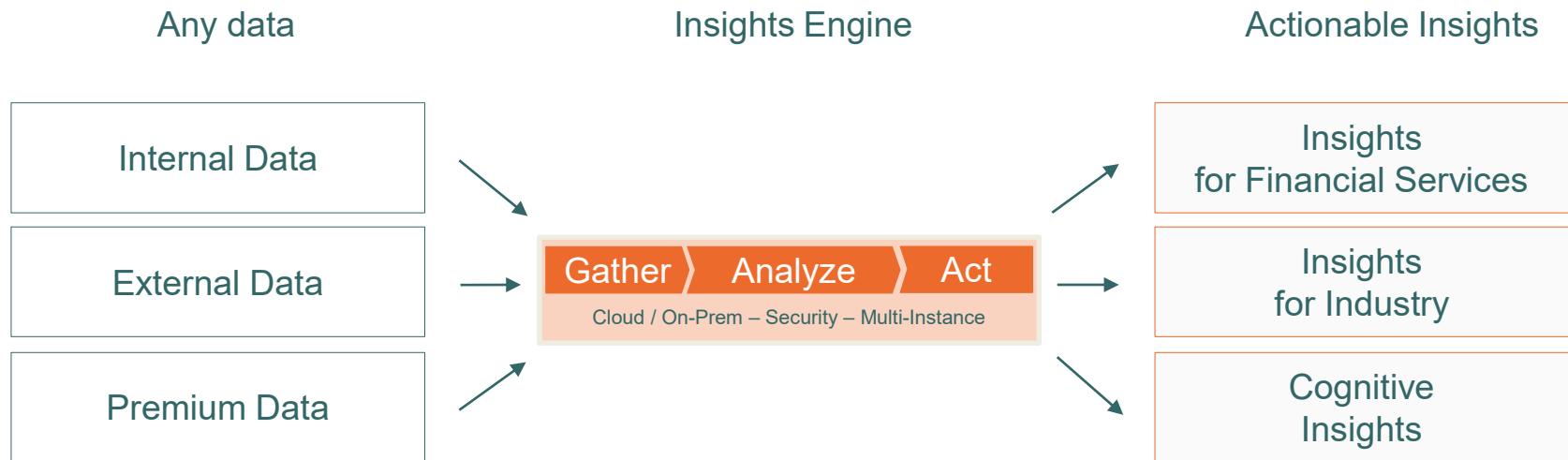
Adama is leading the market of nematicides (\$100 M) in sugarcane, Brazil with its new product - Nimitz

PHILIP MORRIS INTERNATIONAL

Development of unique integrated solution for large-scale industrial precision cultivation of tobacco

Squirro's AI-driven Insights Engine

turning meaningless data into insights



Turning data into a new business

Customer Insights & predicting food safety issues globally

Customer

Bühler is a leading international industrial group in food processing



Challenge

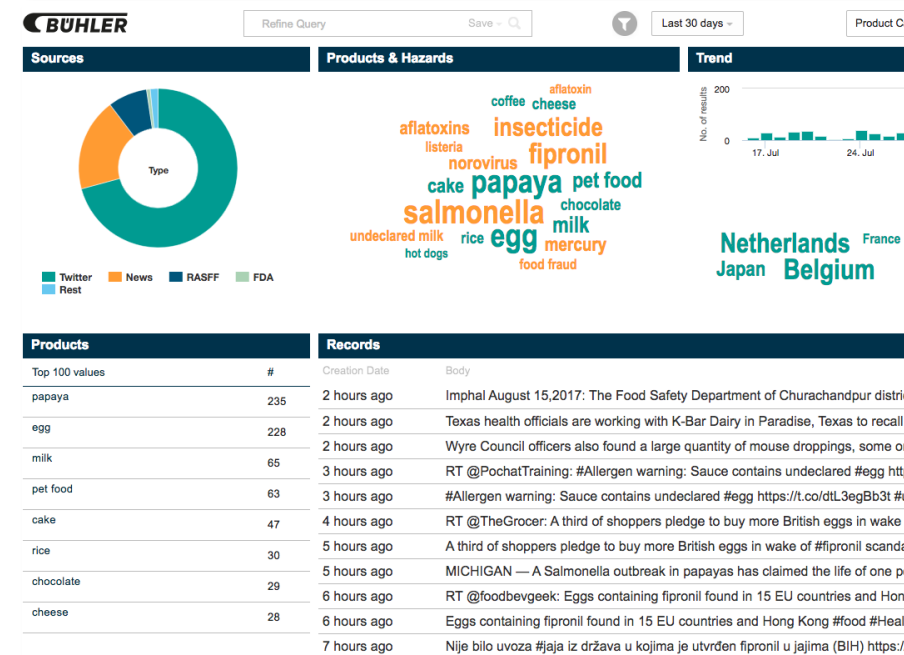
Automate Food Safety Monitoring for internal and as a new digital service to their customers

Solution

A Food Safety Dashboard aggregating and analyzing information deriving from a vast variety of external data sources

Insights

Full food processing chain visibility on any food safety issues; timely alerts & notifications



Safefood.ai is delivering real insight to clients of Buhler on food safety

Risk Insights / Food Safety platform financed by Buhler paid for by its clients



Addressed Areas

- All food categories and risks, including biological, chemical and physical hazards as well as food fraud events.

Users

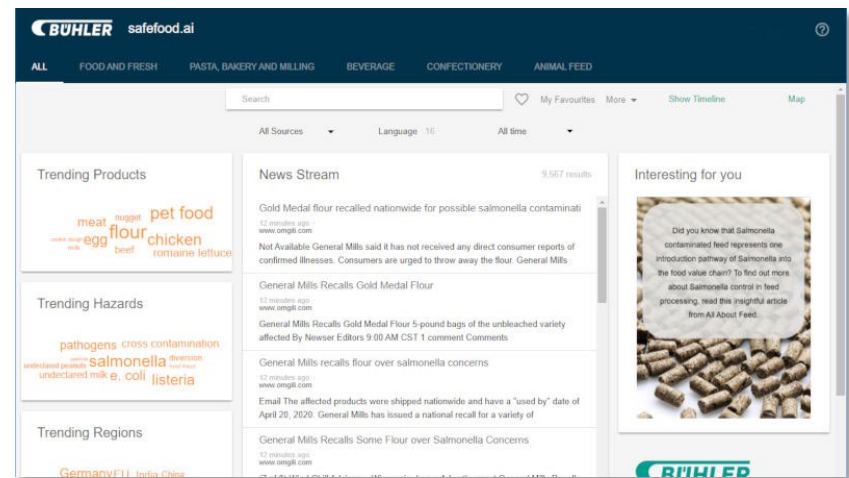
- Food Safety experts
- Quality controllers
- Financial analysts
- Legal experts

Solution

- safefood.ai facilitates risks evaluation and preventive measures to minimize the consequences of food safety incidents and product recalls.

Features

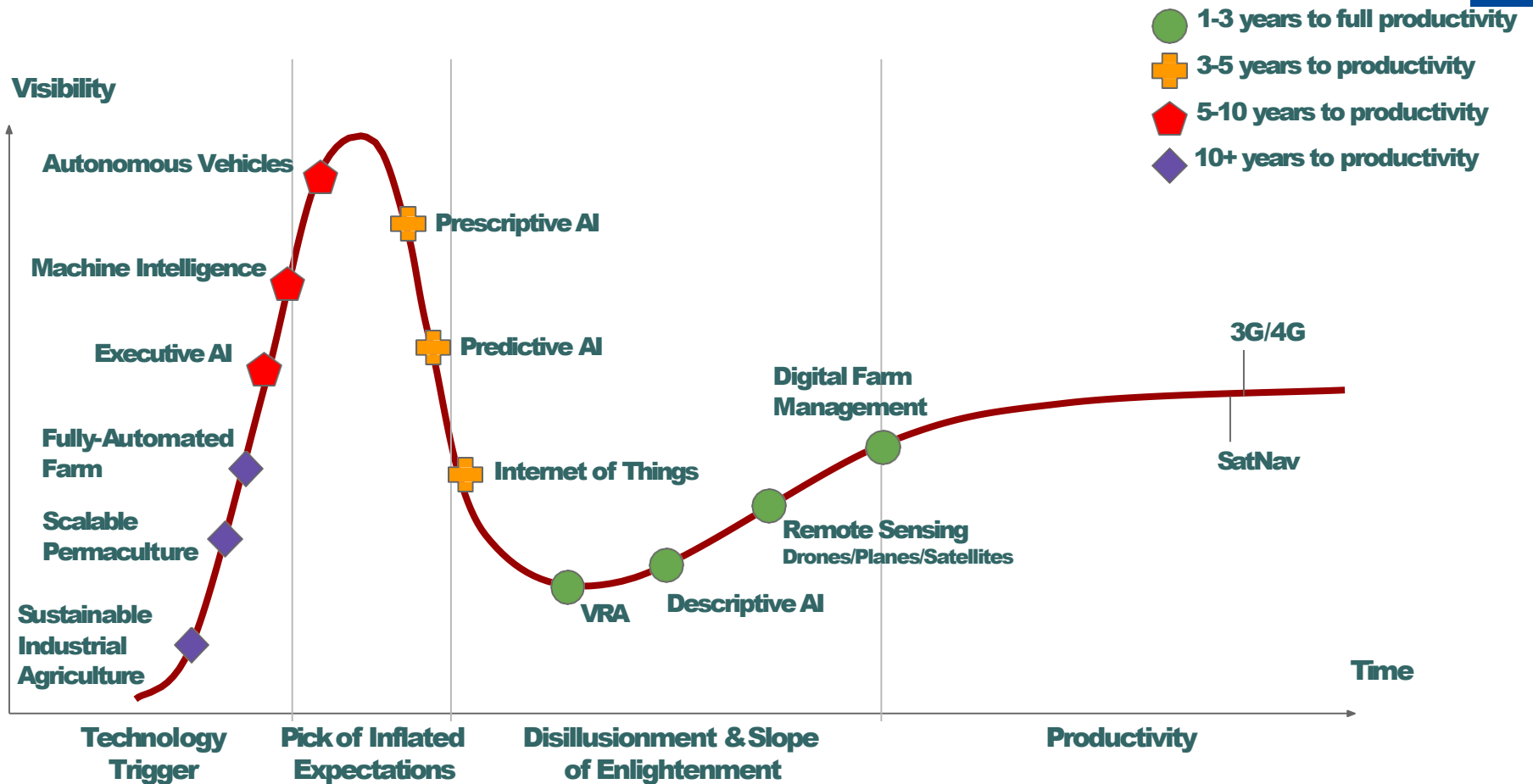
- 24/7 real time event stream
- Food risk identification
- 15 food categories
- Trending products, hazards
- Geographical analysis
- Worldwide coverage
- Social media & public sources
- Qualified news sources
- Governmental sources
- Historical data



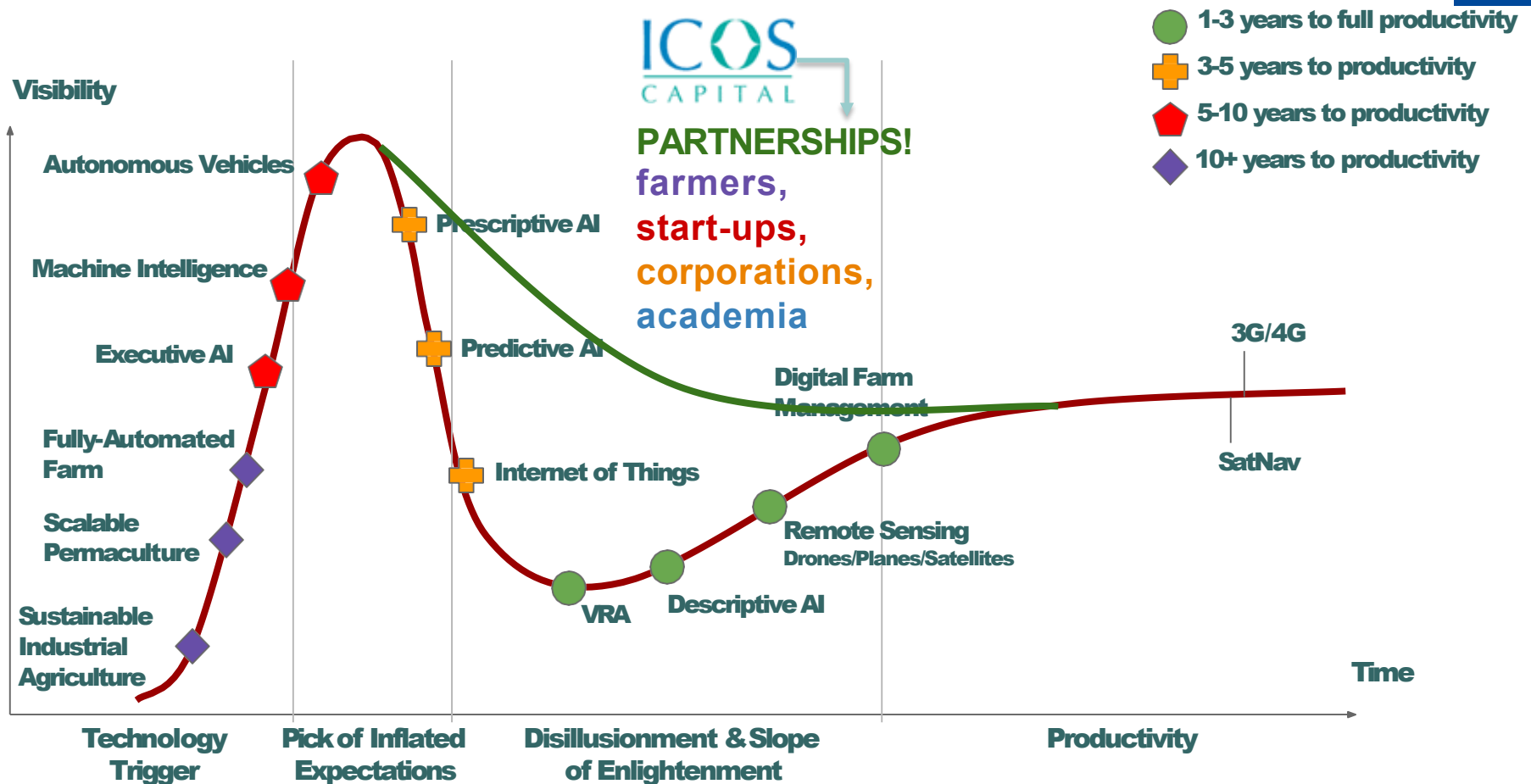
Benefits

- Detect potential food risks early
- Track evolving food risks across the value & distribution chains
- 24/7 automated food risk event detection
- Company and interest specific alerting
- Prevent costly product recalls and reputational damage

Digital farming hype cycle for Agtech is not dissimilar to other sector innovations



Digital farming hype cycle: collaboration and partnerships required to shorten the cycle



Final thoughts: Market in early stages of development

Focus on economically viable solutions implementable now

Business model question: Who will pay for it ?

Directly or in-directly farmers

New business models for
corporations to sell

Are consumers willing to pay for
value chain transparency ?

Evolution & churn

Healthy innovation pipeline: \$3.2
B, 480 deals in 2018 excluding
cross platform tech like Squirro

Slow adoption so far; is there a
killer app or Agtech 2.0 ?

Traditional Ag companies in
“change your business”
acquisition frenzy is similar to
web adoption



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