



Sensors and instruments for effluent monitoring

Alberto Barbi

Company

Dinamica Generale S.p.A. is a global leader in developing **innovative solutions** that reduce costs and minimize environmental impact, combining **advanced technology with sustainability**. Our expertise lies in the design and production of weighing systems, NIR (Near Infrared) sensors and cloud based software for precision agriculture and medical industry.



ITALY



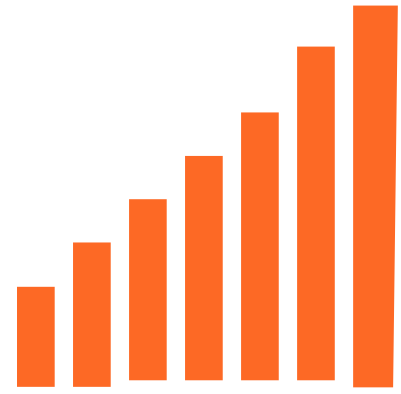
BRAZIL



USA



Our Figures



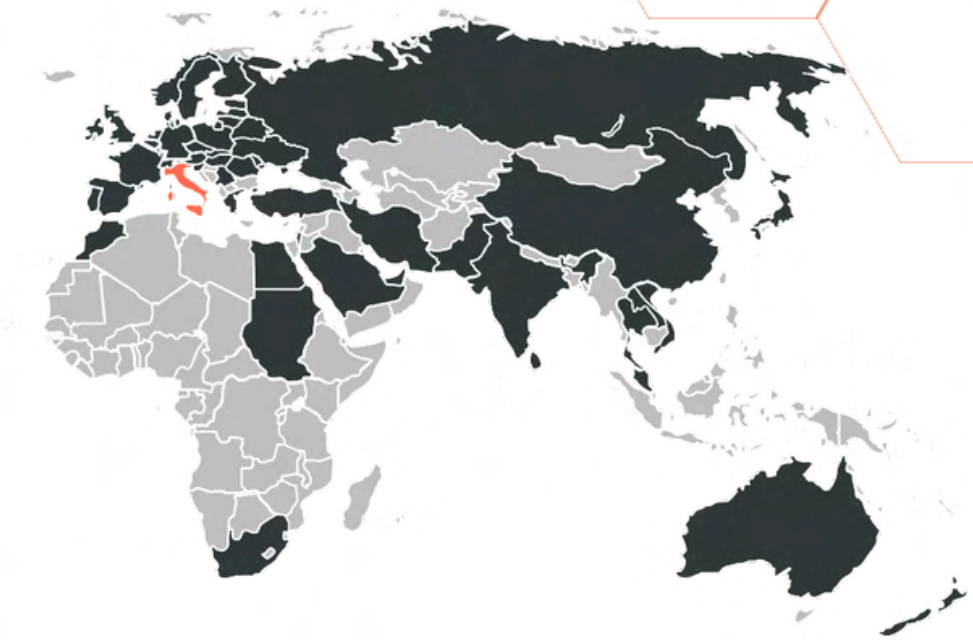
30.000.000 €
Global revenue



+200p
Total employees



+50p
Engineers globally



20.000m²
Square meters surface



10.5%
R&D to revenue



3
Manufacturing facilities



65
State we sell in



Company



Precision Agriculture

Innovative technologies
for smart farming



Precision Feeding

Value-added solutions
for livestock farms



Biomedical

Technological solutions for
biomedical sector



Precision Agriculture Solutions

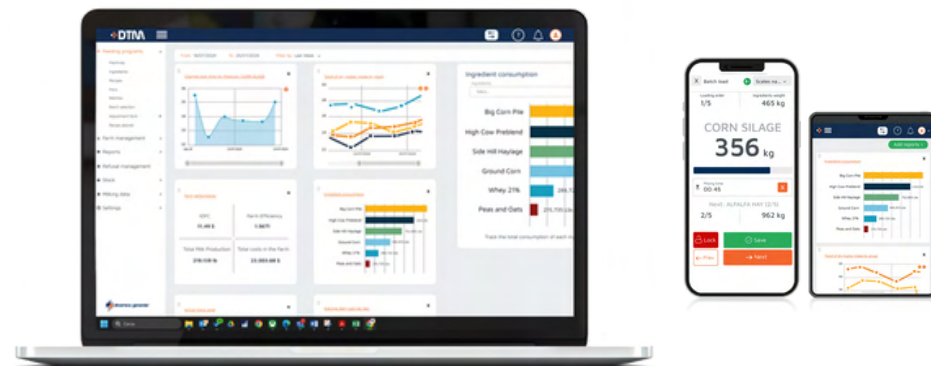


| NIR Analyzers

Cutting-edge technology solutions for real-time analysis that redefine efficiency and accuracy in component evaluation.

| Weighing System

Several configurations and sizes, but never compromise on precision and reliability, which are standard in our solutions.



| In Cloud Software

Software solutions that revolutionize agricultural operations, increasing efficiency and profitability by leveraging cloud technology, data analytics and KPIs.



EVONIR Sensor

Sensor	Sensor InGaAs, 256 pixels, with Peltier cooling
Spectral Range	950-1800 nm
Optic Resolution	FHWM 6nm
Type of Measurements	Diffuse Reflectance
Grade Protection	IP69K
Communication	WiFi, 4G, Isobus, CanJ1939, Modbus
Software	Field Trace, DTM, NIR Evolution
Dimension	17 x 23 x 17h cm - 4 kg
Material	Anodised Aluminium - Military standard
Working Temperature	-10 / +50 °C (14 / +122 °F)
Power	12-32 v



Installed on agricultural machinery or in line in production plants, **EVONIR** is the most **versatile NIR analyzer** in the market and it is capable of measuring: **dry matter, protein, starch, fiber, acid detergent fiber, ash, sugar, N-P-K and many other nutrients in real-time with outstanding accuracy.**



EVONIR: All-in-1 Sensor

Forage Harvester



Baler Machine



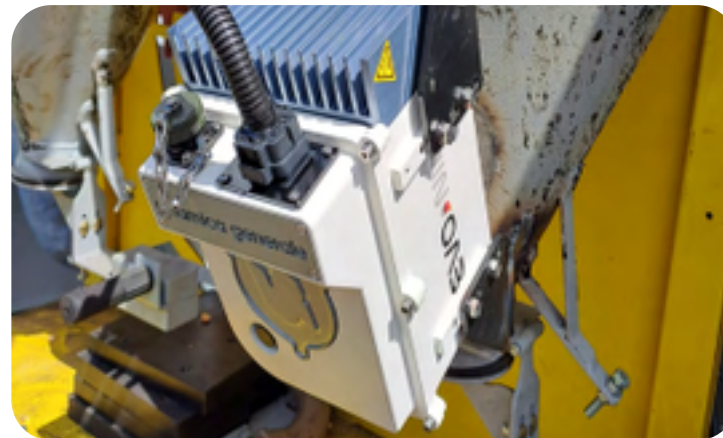
Forage Wagon



Combine



Industry



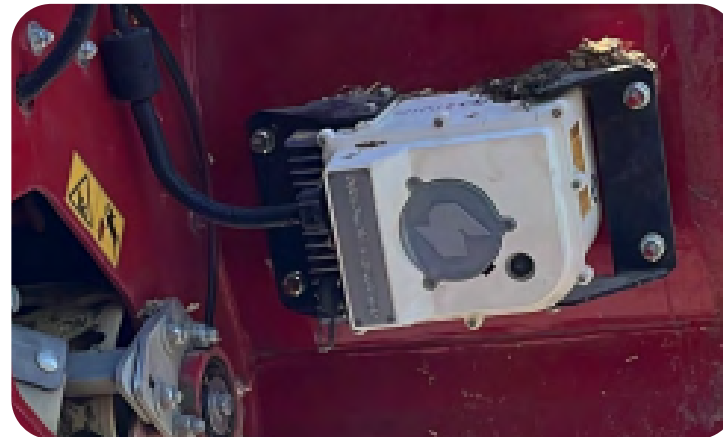
Sugar Cane Harvester



Slurry Tanker



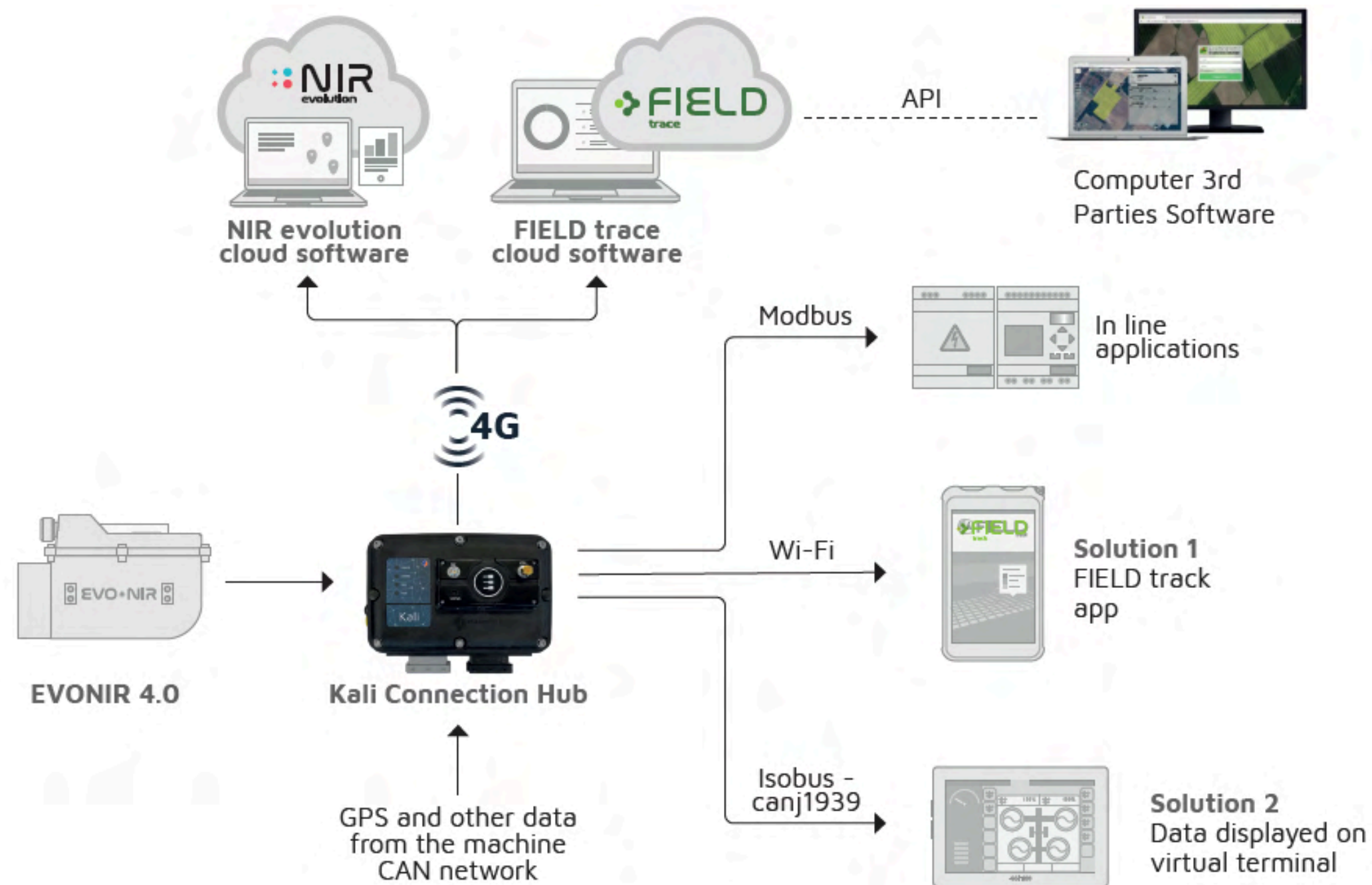
Feed Mixer



AGRINIR



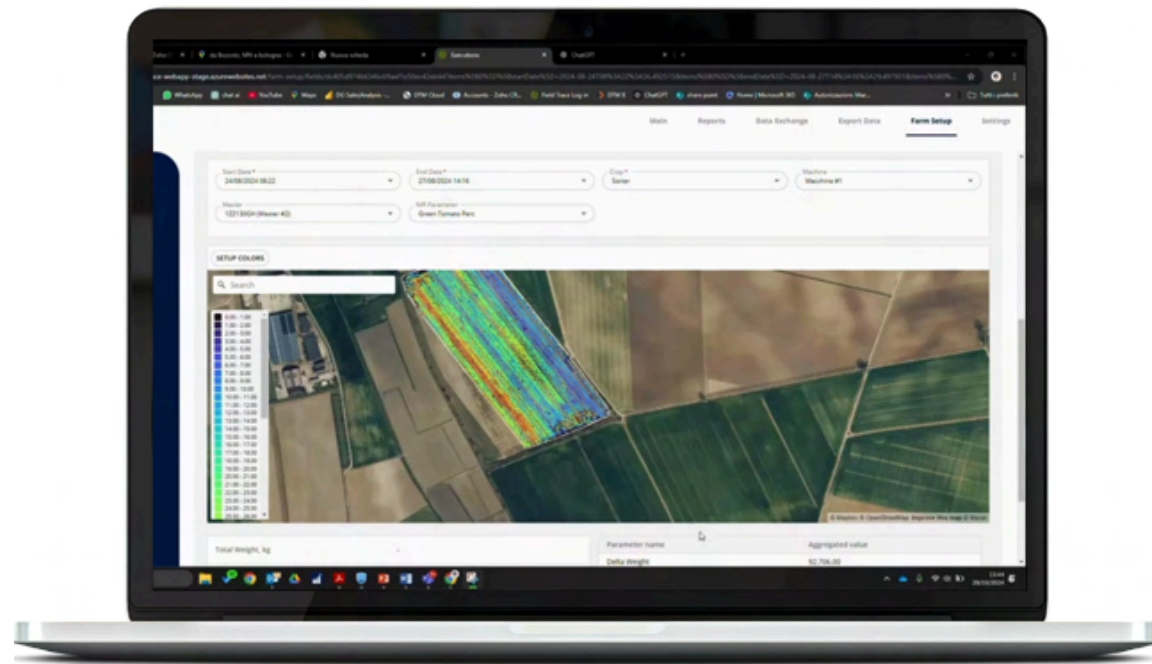
EVONIR Architecture



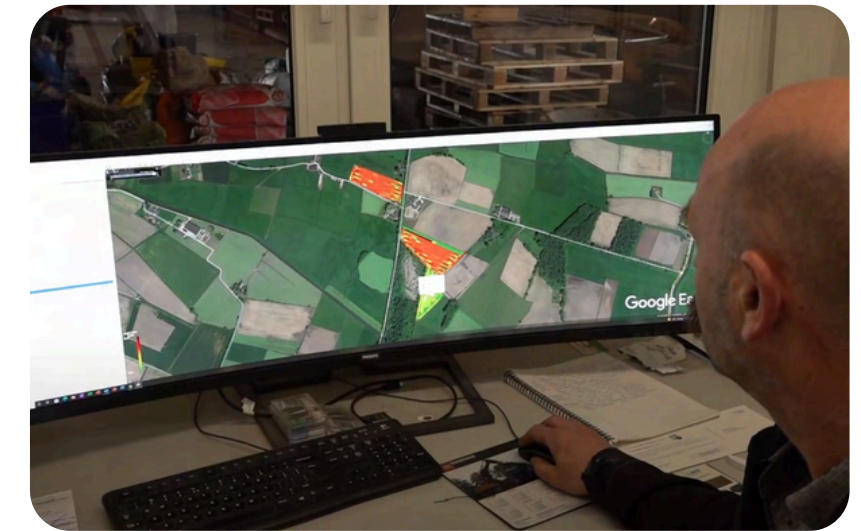
EVONIR features a built-in predictive engine based on **machine learning technology** that increases the accuracy of real-time predictions. These new improvements aim to simplify customers' lives by reducing manual operations through **automatic transfer of data and spectra**, as well as automatic updating of firmware and calibration curves.



FIELD trace



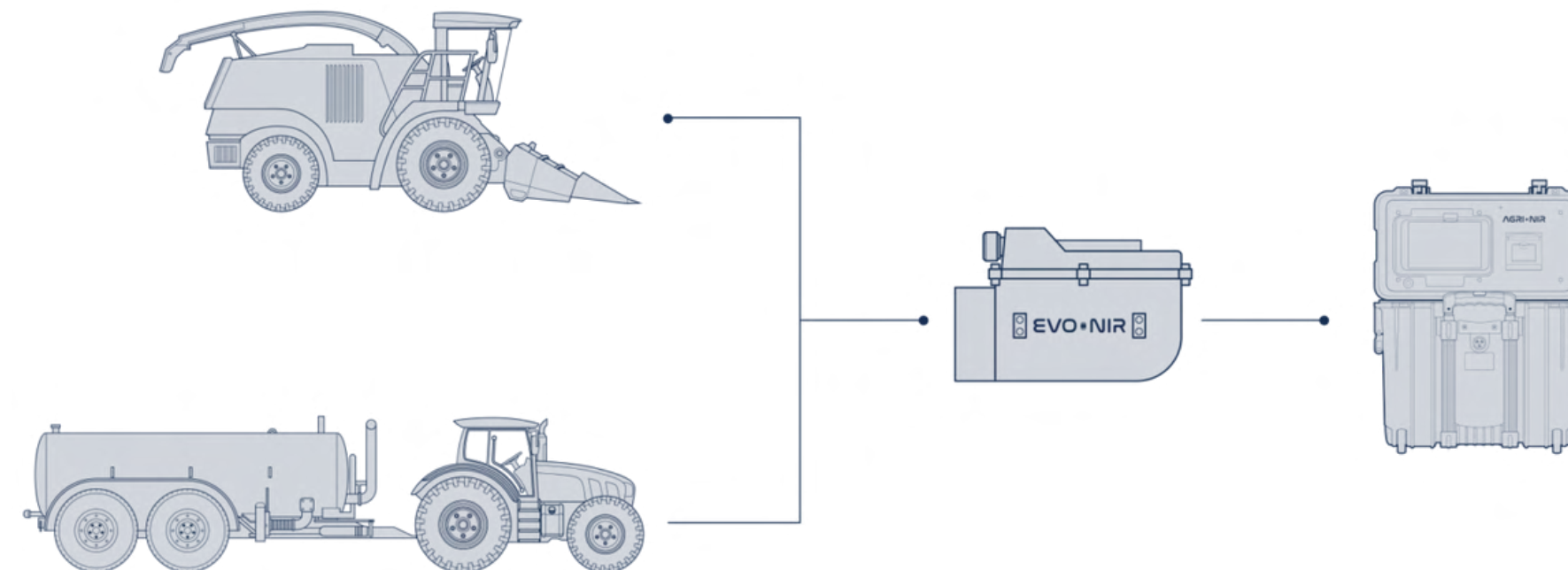
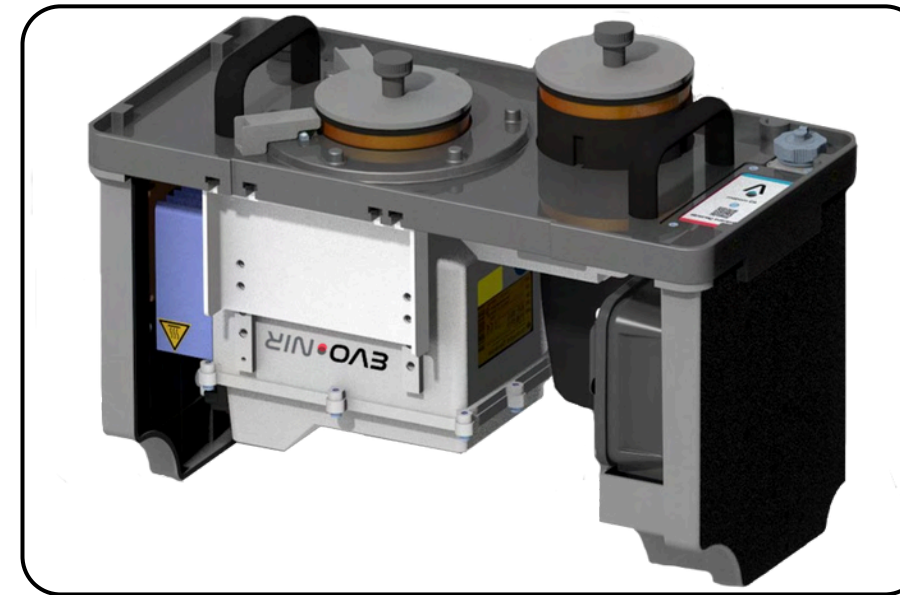
FIELD trace is an advanced cloud-based software for managing **in field operations** from soil preparation to harvesting.



The software connects with **FIELD track** and **FIELD scale** to collect all data, weight and **NIR data**, into one big data cloud software to turn real-time field information into actionable decisions. FIELD trace empowers farmers with **real-time precision farming data**, offering valuable insights from every field and enabling them to optimize crop yields, improve resource efficiency and **plan next-season treatments**.



NIRreverse



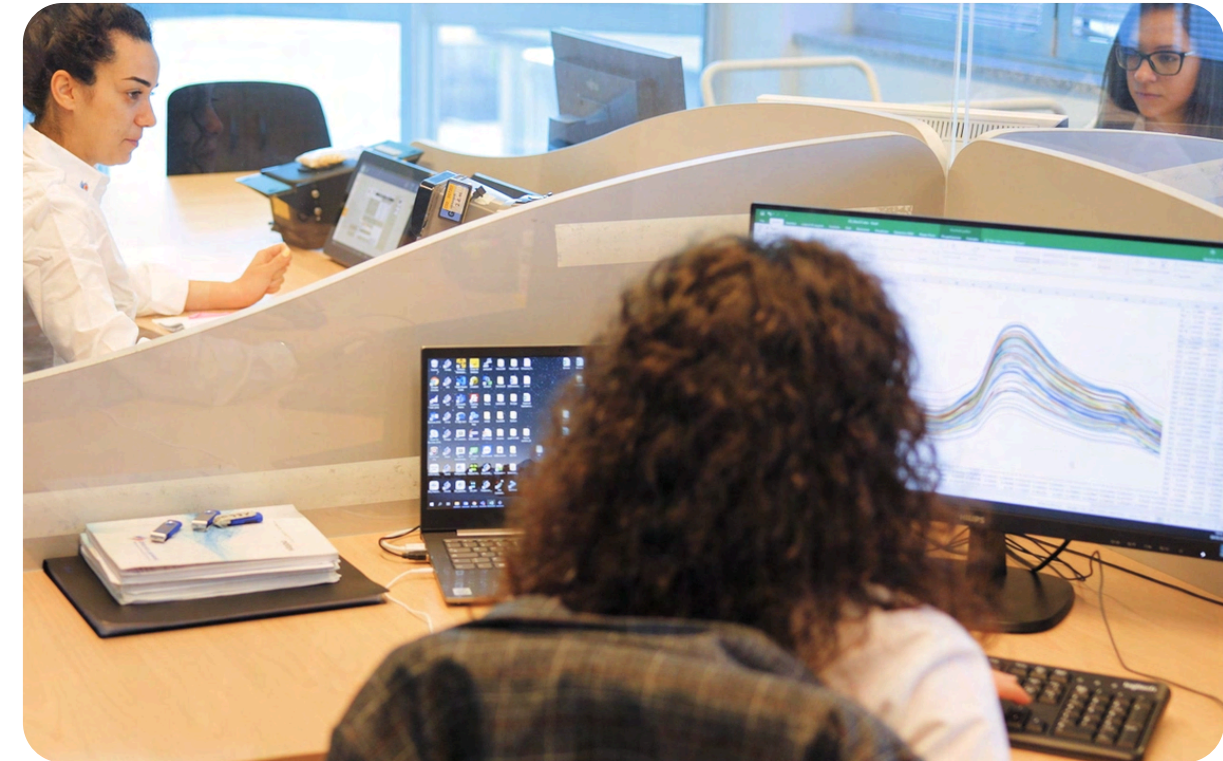
NIRreverse is the one-stop solution to explore the potential of NIR analyzers all year-round.

When the harvesting-spreading season ends, harness the power of your NIR sensor for monitoring feed quality on-the go. Take off the sensor from the machine, put it on the trolley case and gain outstanding feed management with superior flexibility. Dinamica Generale introduced the concept of **Reverse Engineering** to the **NIR sensor applied on agricultural machines.**



Development Team

- A team of world-class talented **engineers and mathematicians focused on NIR research and development of predictive models** using cutting-edge machine learning techniques.
- **Thousands of samples** collected worldwide and partnerships with the laboratories for the management of calibration curves.
- Exclusive **patents on different applications**: automatic adjustment of the target weight for feedstuffs and water on feed mixers, NIR and imaging analysis on harvesting machines.
- **In-house lab** for extensive calibration curve creation capabilities.
- Cloud-based software for management of calibration curves.



Internal firmware
development and deployment



In-house development
of calibration curves



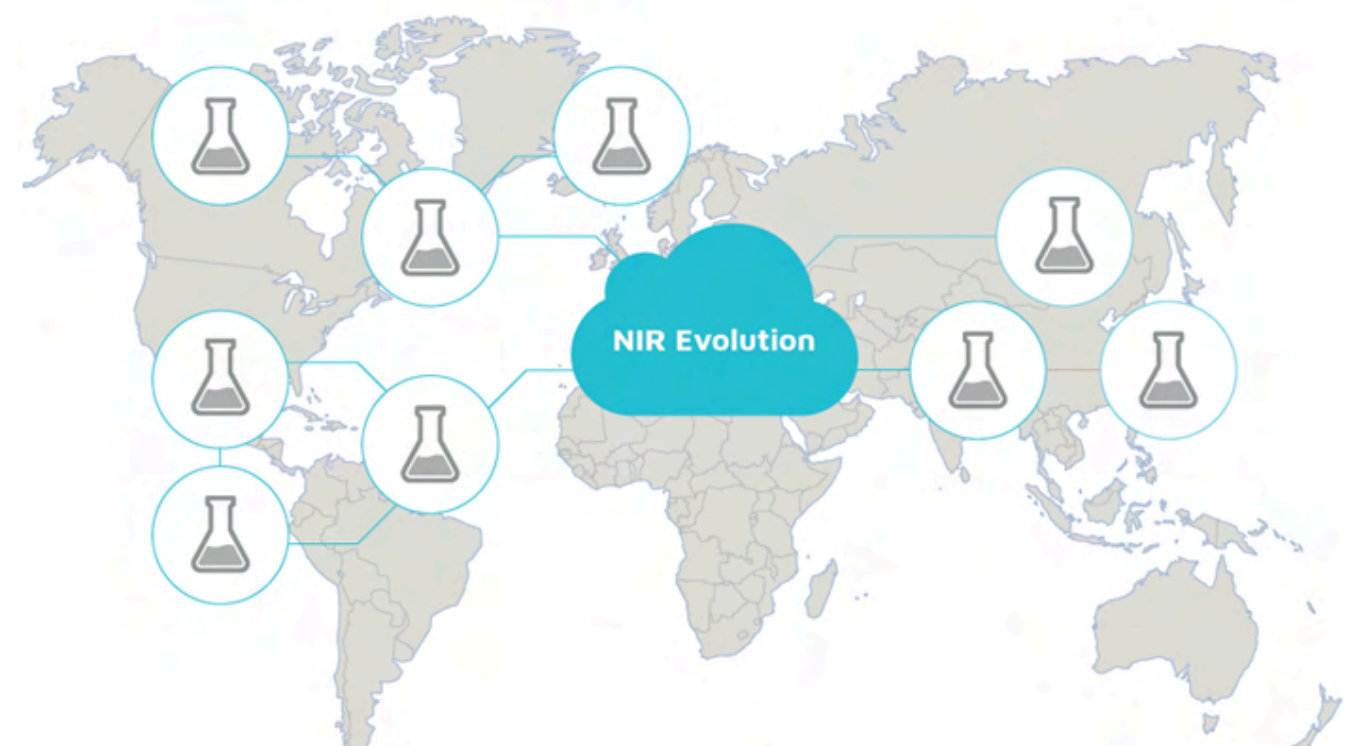
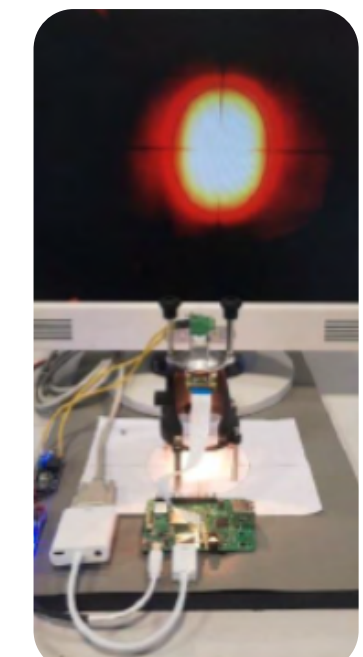
Insourcing hardware and
Cloud software development



Laboratories



In Dinamica Generale, we can count on **a laboratory with thousands of reference samples** and with the most advanced technologies for testing, analysis, and development of predictive models.



With the aim of keeping our **NIR analyzers at maximum performance**, we have established partnership with a world wide network of certified labs.



NIR evolution software

NIR evolution cloud software makes work more efficient and proactive:

- **Quick access to new calibrations update**

NIR evolution ensures that your instruments are using the latest calibration updates. This means better prediction accuracy and greater effectiveness from your time on-farm/in field. New calibrations curves can be downloaded in your NIR analyzer wireless at any time.

- **Reliable predictions**

NIR evolution enables you to improve prediction the performance of your NIR device. This remote monitoring and prediction improvement increases the performance of your daily analysis.

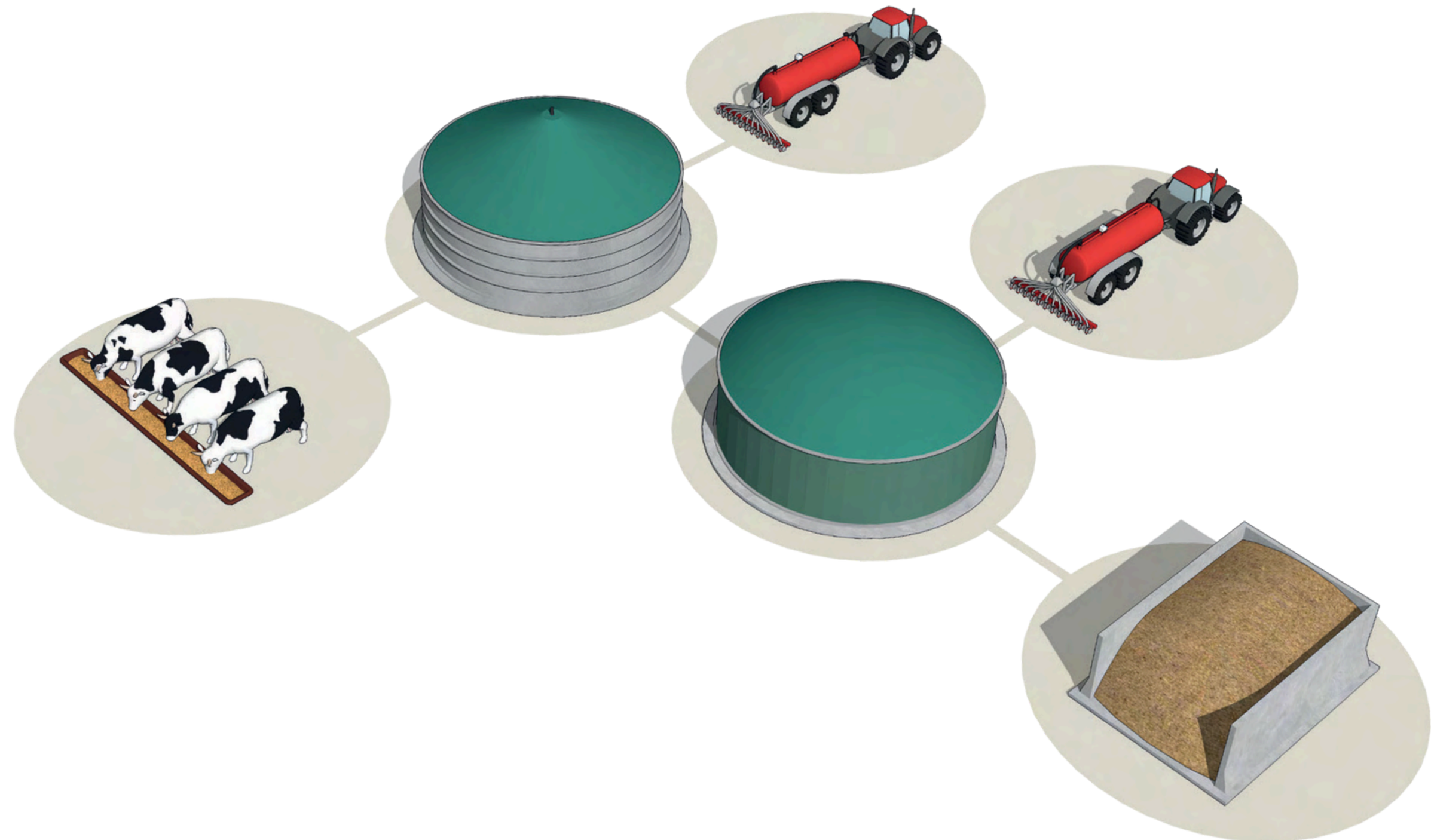
- **Save time and money**

By gaining control over sampling and predictions, feeding analysis becomes more efficient. This means no more time-consuming for lab analysis.



Biogas plant

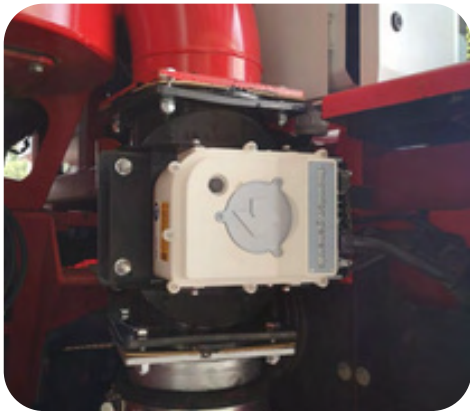
NIR analyzers offer a valuable toolset for biogas plants, **enabling efficient and effective monitoring, analysis and optimization of the biogas production process**. By identifying variations or deviations in feedstock quality, operators can quickly adjust the process parameters to maintain optimal conditions.



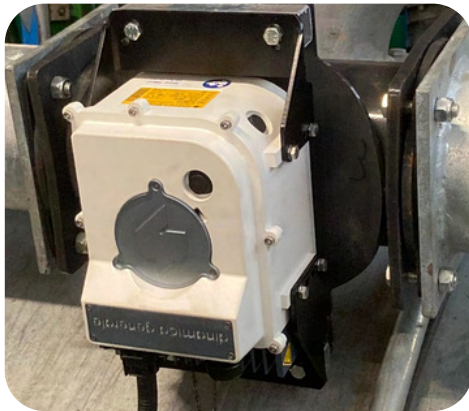
Slurry Tanker



Fit All Models of Slurry Tanker



Drag-hose



Trailed



Self-Propelled

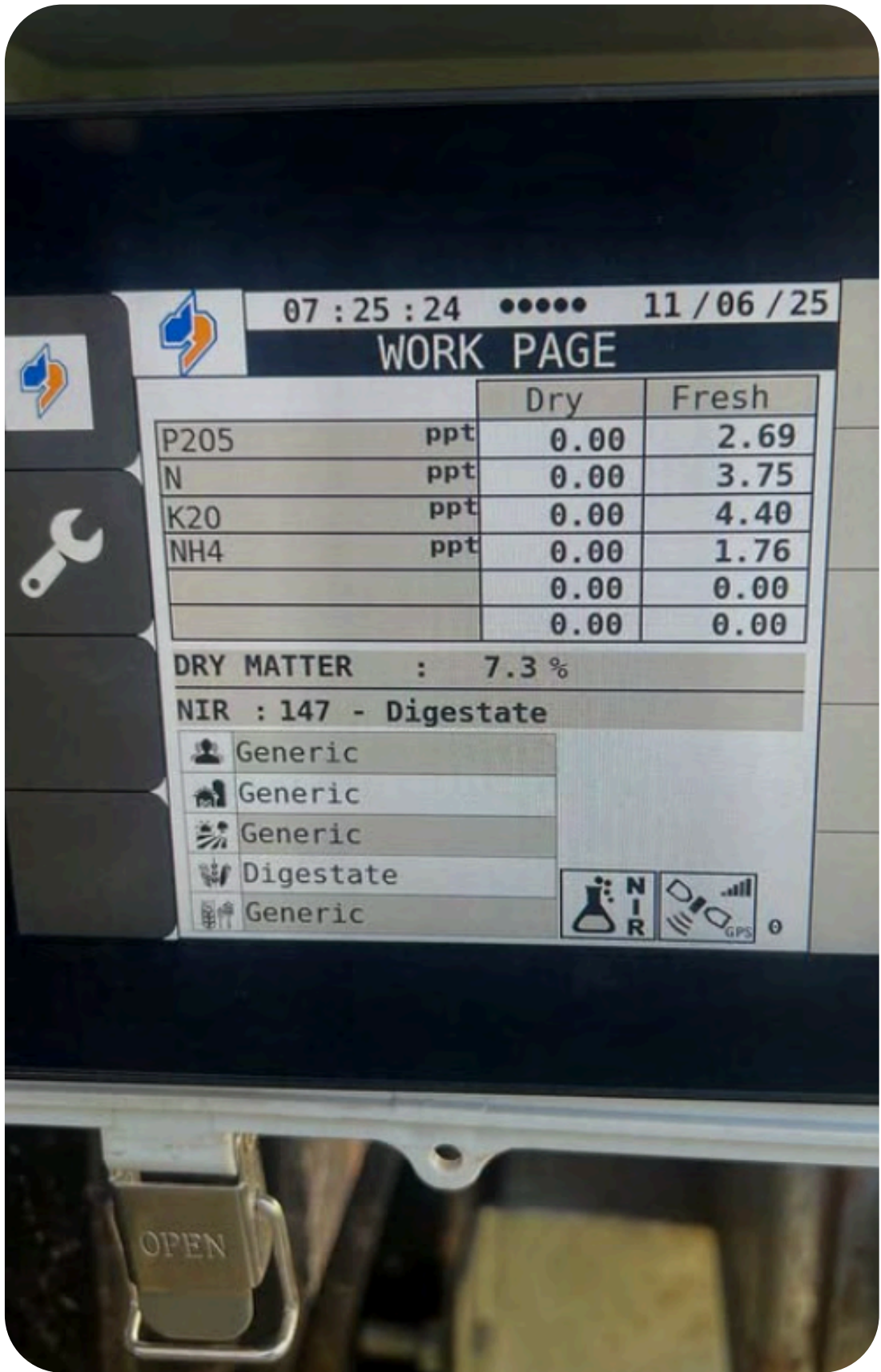


Precise slurry application thanks to Real-Time N,P,K Analysis

NIR Family	Moisture	N	P205	K20	NH4
Cow Slurry	●	●	●	●	●
Pig Slurry	●	●	●	●	●
Digestate	●	●	●	●	●
Pig&Cow Mix. Slurry	●	●	●	●	●



Installation of EVONIR on a slurry tanker at the Fusi Giovanni Farm



Sample analysis results

EVONIR				
	ID	DM %	N [kg/m ³]	NH4-N [kg/m ³]
POZZA 1	1	6,0	3,9	2,3
	2	6,0	3,9	2,3
	3	6,0	3,9	2,3
	4	6,0	3,9	2,3
	5	6,0	3,9	2,3
POZZA 2	6	4,4	3,1	2,1
	7	4,5	3,1	2,1
	8	4,5	3,2	2,1
	9	4,4	3,1	2,1
	10	4,5	3,1	2,1
LUFA NRW				
	ID	DM %	N [kg/m ³]	NH4-N [kg/m ³]
POZZA 1	1	6,1	3,6	2,4
	2			
	3			
	4	6,1	3,8	2,5
	5	6,1	3,7	2,5
POZZA 2	6	4,5	2,6	1,7
	7			
	8	4,4	2,6	1,7
	9			
	10	4,5	2,6	1,6

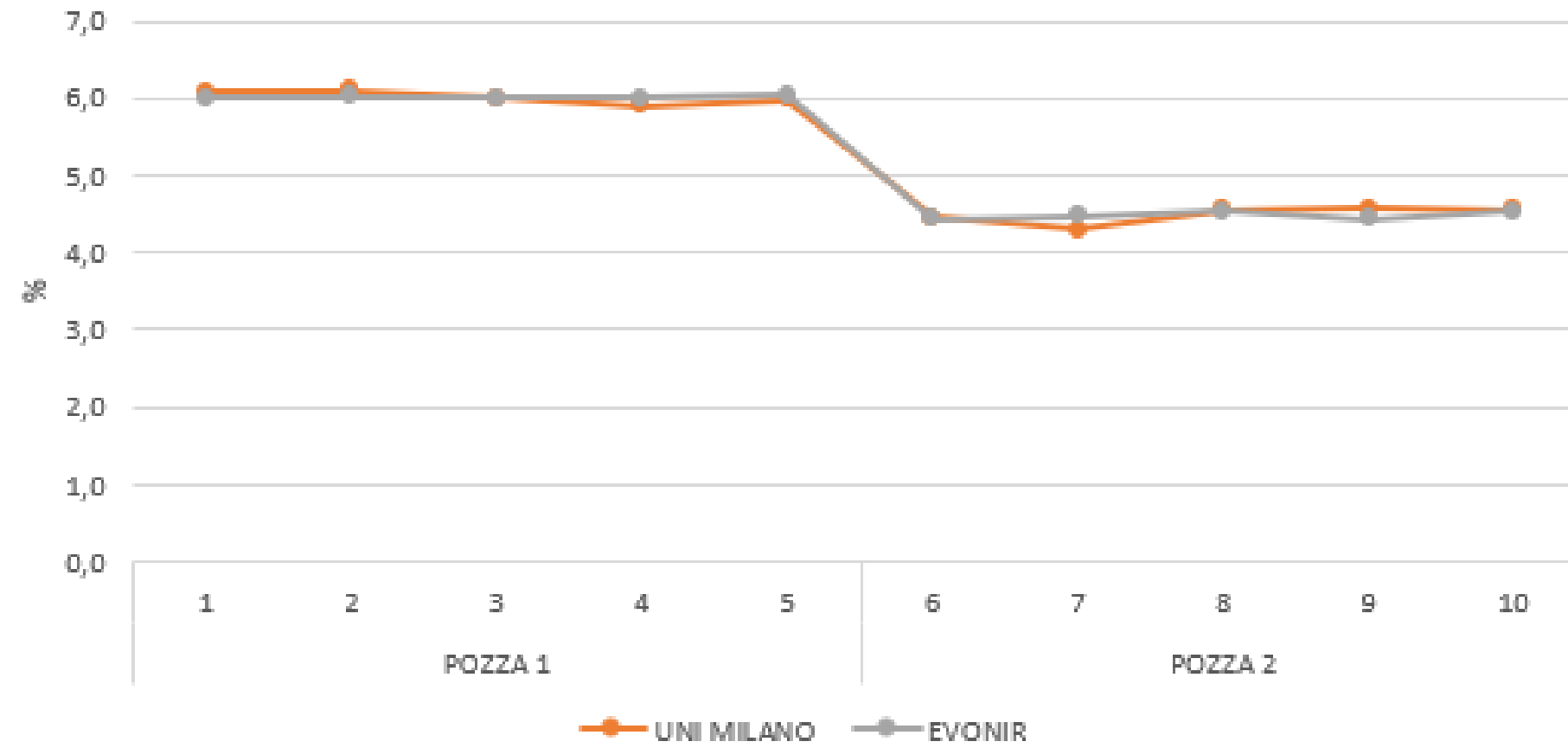
EVONIR and laboratory analysis results

UNI MILANO		
DM %	N [kg/m ³]	NH4-N [kg/m ³]
6,1	4,1	2,6
6,1	4,1	2,6
6,0	4,1	2,6
5,9	4,1	2,6
6,0	4,1	2,6
4,5	2,9	1,8
4,3	2,9	1,8
4,6	2,9	1,8
4,6	2,9	1,8
4,6	2,9	1,8

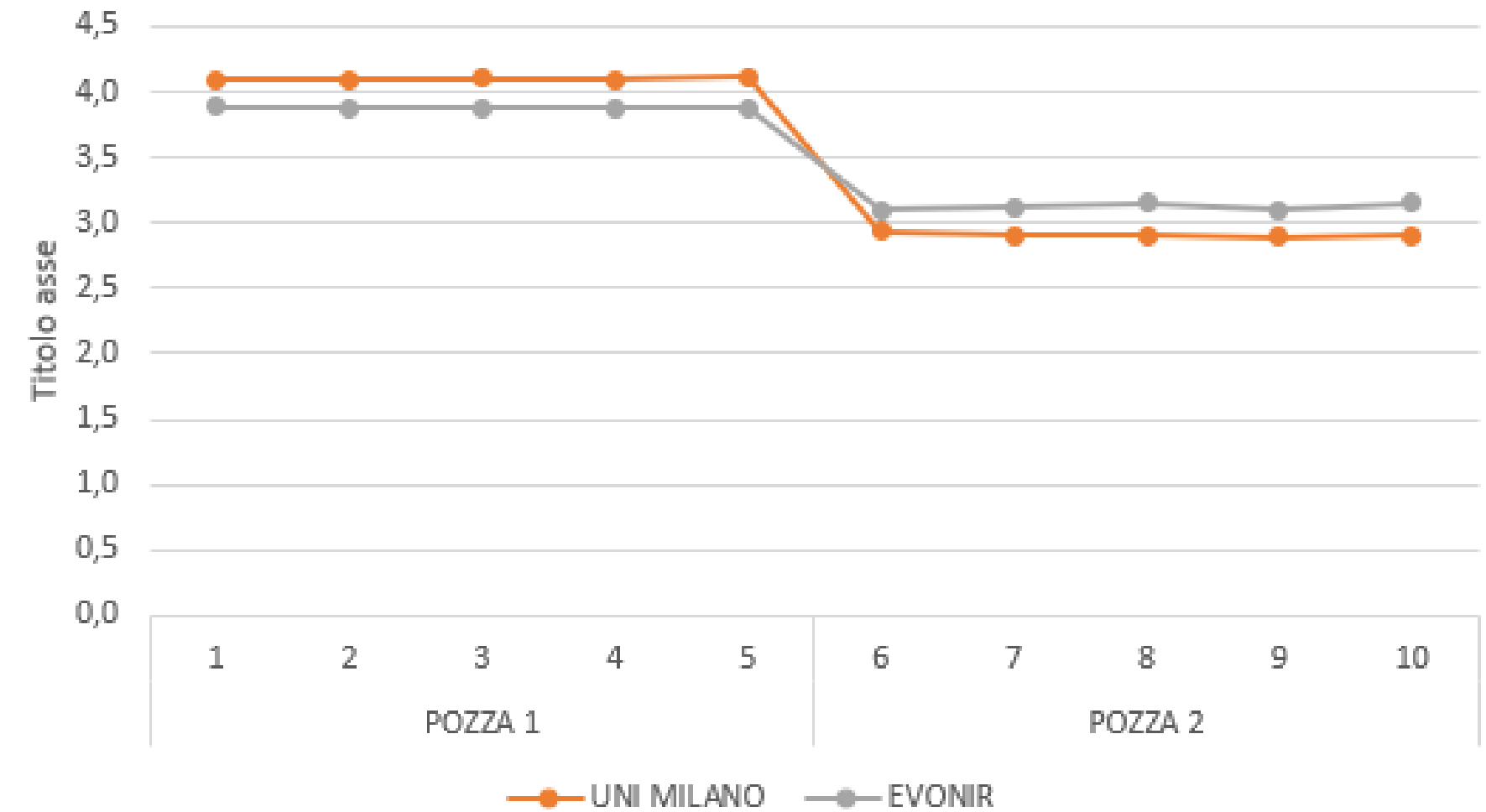


Sample analysis results

DM %



N [kg/m³]



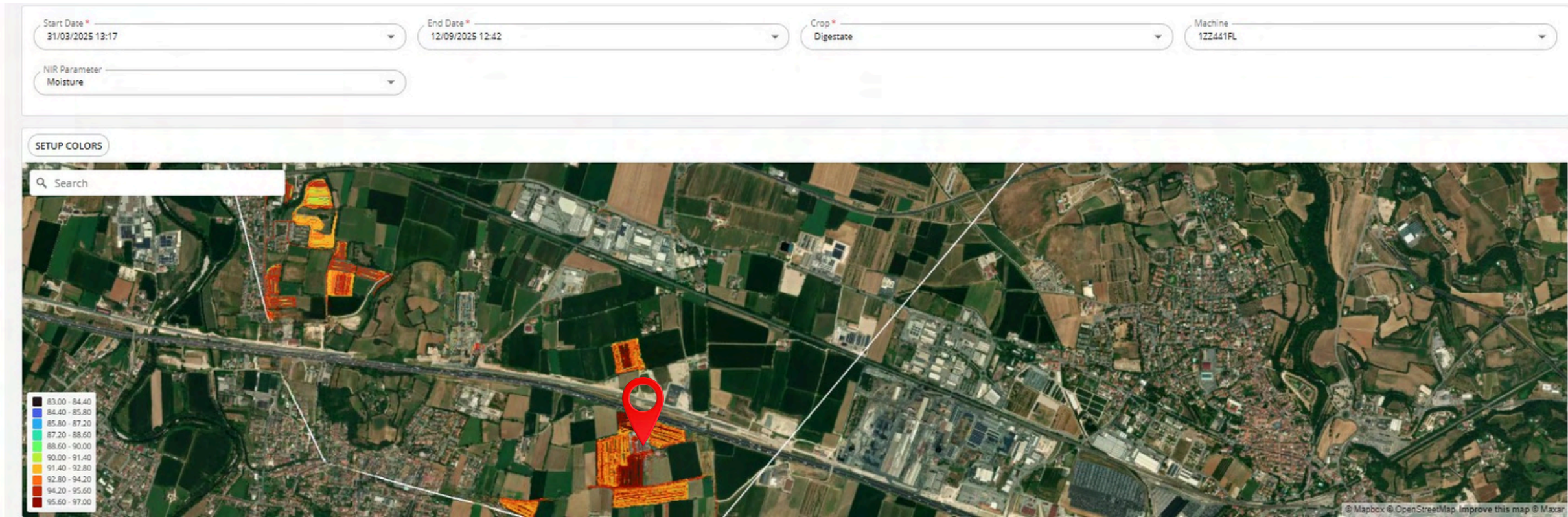
LUFA - EVONIR		DM	N	NH4
	Pozza 1	0,1	-0,2	0,2
	Pozza 2	0,0	-0,5	-0,4
	media	0,0	-0,4	-0,1
UniMI - EVONIR		DM	N	NH4
	Pozza 1	0,0	0,2	0,3
	Pozza 2	0,0	-0,2	-0,3
	media	0,0	0,0	0,0

Comparison of data between EVONIR and laboratory



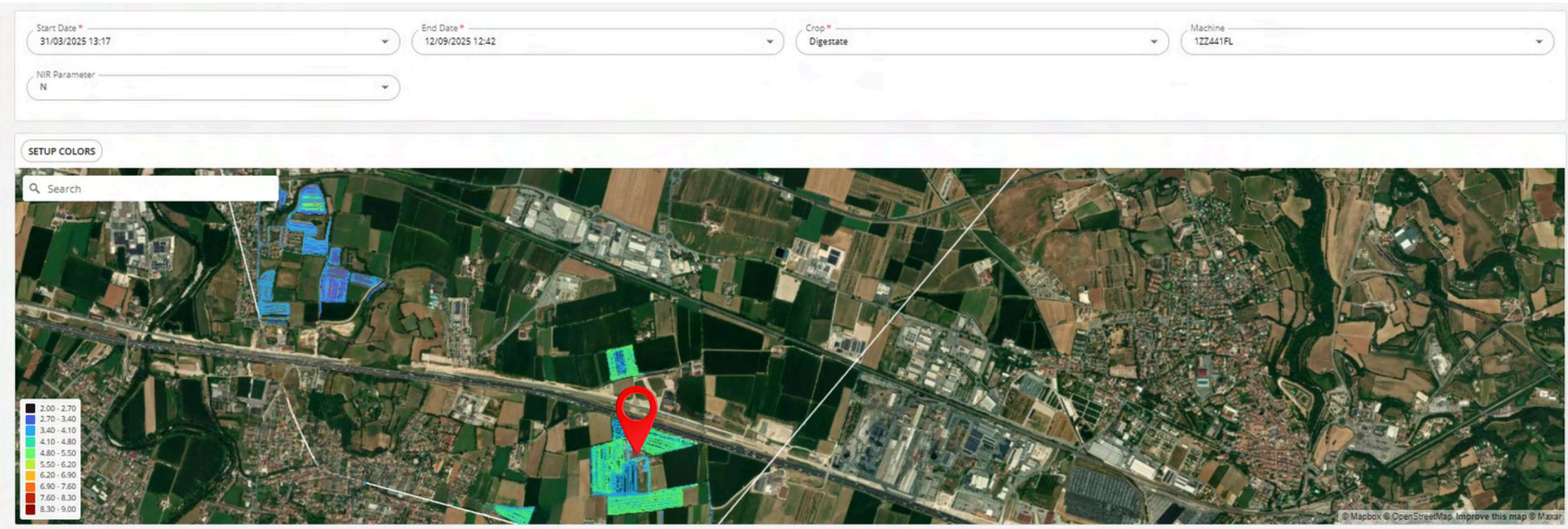
FIELD trace software

- Fields
- Machines
- Crops
- Operators
- Trucks
- Destinations



dry matter value

- Fields
- Machines
- Crops
- Operators
- Trucks
- Destinations



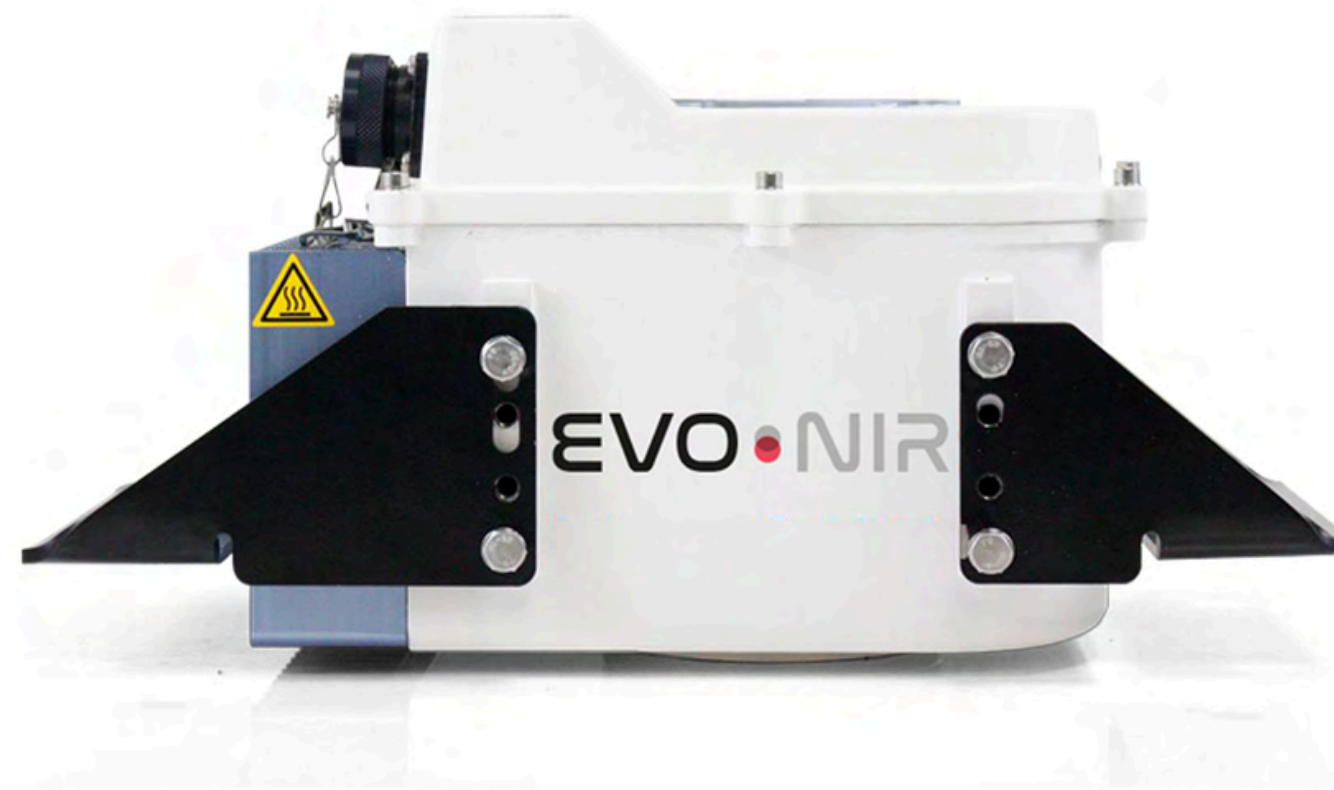
N value



DLG certifications

EVONIR is DLG certified for cow, pig, mixed slurry and digestate

EVONIR has earned three DLG certifications for accuracy and reliability in NIR analysis, a recognition that highlights the quality of the sensor and its ability to deliver precise and reliable data.





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Electronic Solutions & Sensors



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