



ევროკავშირი
საქართველოსთვის
The European Union for Georgia



METOS: digital potato monitoring

Fikriye Berk, Executive Director, Metos Turkey



TURNING INFORMATION INTO PROFITS



METOS: Digital POTATO monitoring



ABOUT THE COMPANY

Experienced, Global, Successful!

REPRESENTATIONS DEALERS & AFTER-SALES SERVICE POINTS:

All EU Countries

Egypt

India

Israel

Argentina

Mexico

Vietnam

Philippines

Peru

Colombia

Bolivia

Indonesia

Niger

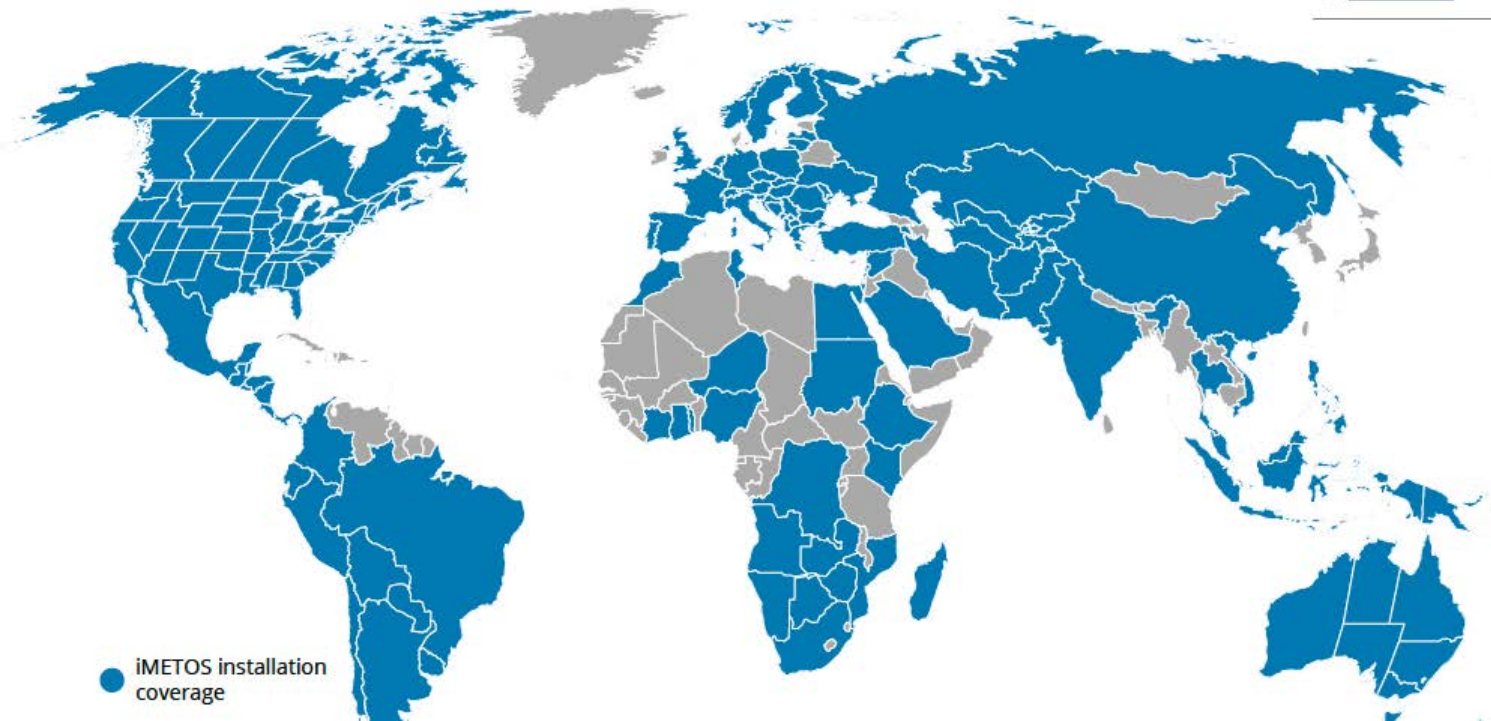
Kenia

Russia

GLOBAL HEADQUARTERS:

Weiz, Austria

Stations Installations



AFFILIATES & DISTRIBUTORS

METOS® ANZ

METOS® BRASIL

METOS® FRANCE

METOS® IBERIA

METOS® ITALY

METOS® LATAM

METOS® MOLDOVA

METOS® MX

METOS® POLSKA

METOS® SOUTH AFRICA

METOS® SOUTH-EAST ASIA

METOS® TURKEY

METOS® UKRAINE

METOS® USA

AQUAGRI
(Portugal)

AGRIPRECISION
(Morocco)

> **65.000 stations**
up & running

> **600.000 sensors**
connected

> **85**
countries
installed

> **185**
people
employed

36 Years of Innovation and Field Solutions

INTERFACE PARTNERS



TELECOMMUNICATION PARTNERS



SENSOR PARTNERS



INPUT INDUSTRY PARTNERS



The Connected Field = Less Risk & Higher ROI



SEEDING + FIELD ACCESSIBILITY + SPRAY WEATHER + WORK FORCE MANAGEMENT +
IRRIGATION + REAL TIME ALERTS + REACT ON TIME



= BETTER MANAGEMENT, OPTIMIZED INPUT, RISK REDUCTION – HIGHER ROI

**iMETOS WEATHER
STATIONS, DATA
LOGGERS & SOFTWARE
SOLUTIONS**

Metos weather station models for farmers and Customers

NEW IN 2021



NB-IoT

LoRAIN Only Rain

- Weather Forecast



NB-IoT

LoRAIN SOIL

- Irrigation management
- Weather Forecast
- Delta T for spraying



NB-IoT

μMETOS CLIMA

- Disease control
- Pest control
- Weather Forecast
- Drift Control



NB-IoT

μMETOS SOIL

- + Sentek Drill & Drop
- Triscan probe
- Irrigation management
- Weather Forecast



LTE

iMETOS ECO D3

- + Sentek Drill & Drop
- Triscan probe
- Irrigation management
- Weather Forecast



LTE

iMETOS 300 USW

- Disease control
- Pest control
- Weather Forecast
- Drift Control
- ET

IoT Hardware, Decision Support Systems and Hyper Local weather forecast/AI/Planning tools



METOSLine

- Weather monitoring
- Weather forecast
- Disease modeling
- Work management







CropView and iSCOUT

- Remote insect monitoring
- Remote crop monitoring
- Fruit growth monitoring



iMETOSVWS

All the functionality of a full weather station, but without the precision

User friendly monitoring tools	Qualitative solutions	Benefits & profits
		<ul style="list-style-type: none"> ✓ A detailed activity report about when, when and how much the machine has been running ✓ Current position of all active machines ✓ Enhanced work planning ✓ Automatic shift control of assembly setting upon available "forecast"
		<ul style="list-style-type: none"> ✓ When, when and how much the object has been used ✓ Allows the optimization of preventive maintenance, enables automatic downtime station and the setup of work for creating equipment ✓ Automatic shift control of assembly setting upon available "forecast"

Tracker - NBloT

Active and Object Trackers for asset management



Farm View

Field centric data - sensors, boundary and imagery



Weather forecast

Site specific, hourly updated forecasts



MobiLab

Zone specific soil and SAP testing, with results in 2 hours

Holistic Solutions for the Connected Field

- In field Weather Monitoring
- Site Specific Weather Forecasts
- Disease Forecast Modelling
- Crop Monitor
- Insect Monitor
- Soil Moisture Monitor
- Soil Analyses
- Soil Mapping
- Sentinel Satellite
- Storage / Tank Monitoring
- GPS Work Tracking

Active Alerting/Activation

- Plant Protection alerts
- Accident Warning System
- Theft
- Frost warning systems
- Automation in Irrigation



FieldClimate Mobile App



FieldClimate



METOS PRODUCT SOLUTIONS

How to integrate the weather data on potato process

Seeding key weather conditions

- Planting potatoes 0 to 2 weeks after the last spring frost.
- The soil temperature should be at least 50°F (10°C).



Weather station measures:

- Outside temperature
- Soil temperature
- Soil moisture
- Soil analyses
- Evapotranspiration
- Soil pH

Growing key weather conditions

- Maintenance even moisture
- The plants need 1 to 2 inches of water per week
- Diseases potato model caused by a high soil pH, temperature and humidity
- Potatoes like acidic soil (do not plant in soil with a pH higher than 5.2)



Camera devices&traps:

- Disease forecast modelling
- Crop monitoring
- Insect monitoring

Storage key conditions

- Store at cool temperatures (42 to 55 degrees F).
- The room must have high humidity.
- Potatoes need ventilization. Even after harvest, potatoes still use oxygen and give of carbon dioxide so they must have fresh air.



SolGrader calculates:

- a yield prediction
- estimated size distribution



SolAntenna tracks:

- Temperature,
- Humidity
- CO2 levels

A Holistic Solution for Irrigation Management



Soil - plant - atmosphere
monitoring



Data
interpretation



ACTION
When and how much to irrigate



Automation

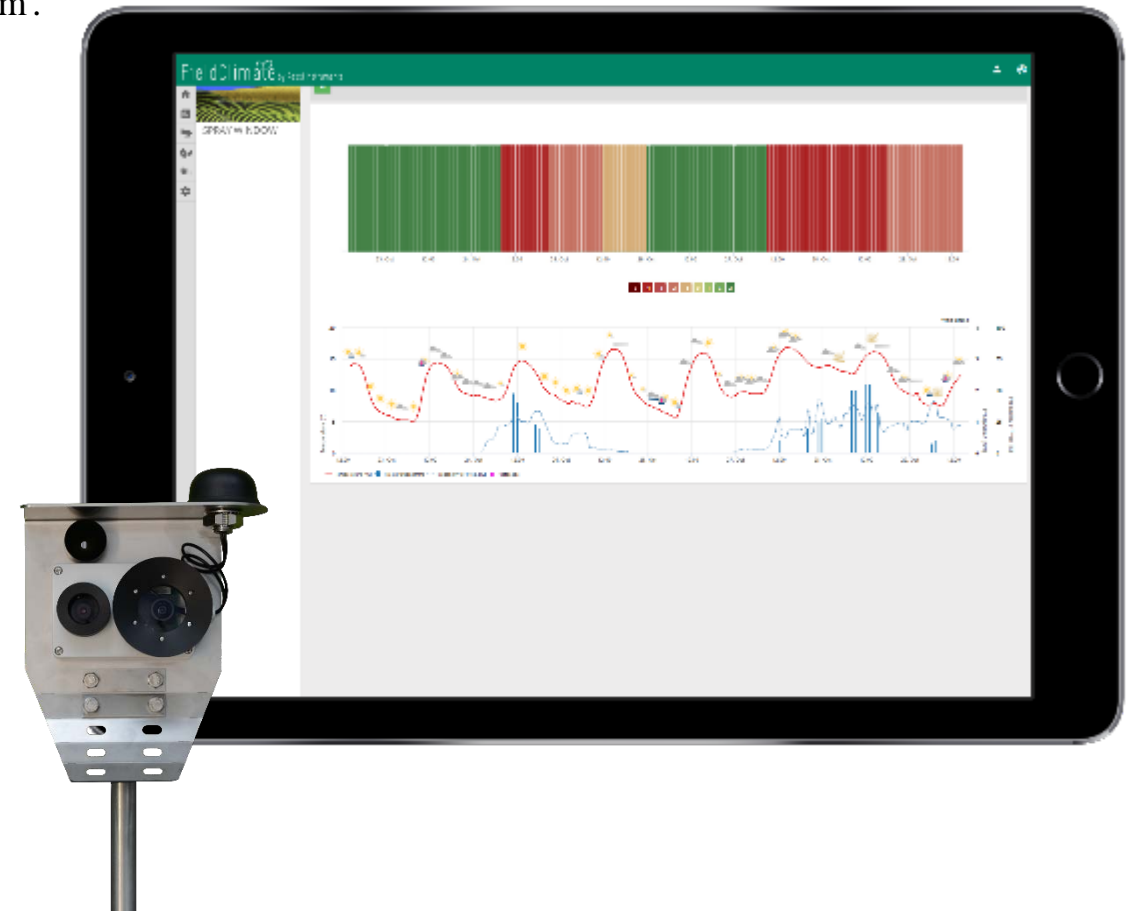
Disease & Pest Models

A plant disease model is a mathematical description of interactions among the environment, the host plant and the variables related to the pathogen that can lead to the development of the disease. The more advanced models are those which can predict the impact or severity of the disease and the development of inoculum.

Pessi Instruments has more than 80 disease models for more than 35 crops, which can be accessed directly through the ng.fieldclimate.com platform.

Remote Field Monitoring with iMETOS CropVIEW

The field camera shows the field conditions, growth of the crop, weed growth, pheno phases of development, attacks of the birds and weather in the own fields remotely. It combines the documentation and permanent observation, weather data and other important data.



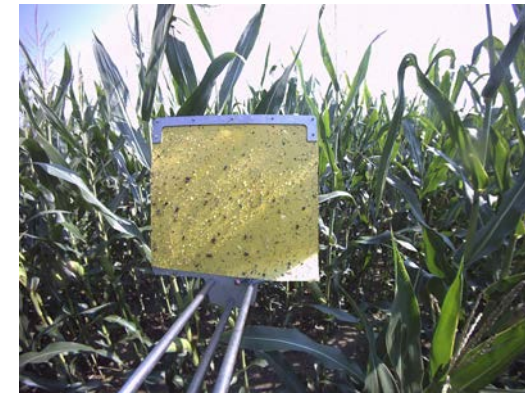
iSCOUT Variations



iSCOUT® Pheromone: Designed to catch insects with the help of insect specific pheromone lure (codling moth and many other species).



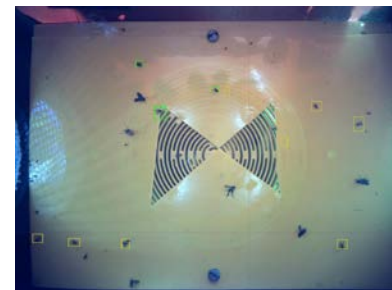
iSCOUT® Fruit Fly: Designed to catch fruit flies (spotted wing drosophila, fruit fly etc.).



iSCOUT® Bug: Designed to catch bugs, without nettings on entries.



iSCOUT® Color Trap and iSCOUT® Color Trap Dual: Developed for monitoring sticky traps of different colors. Device comes with a high-resolution camera and a holder for a sticky plate



iMETOS CropVIEW® is an innovative agricultural information system which guarantees daily remote control of your plants and fruits:

- Check seed germination
- Check the effect of fertilizer or pesticide
- Check if a disease or a pest threatens profitability of your crop
- Check the growth of your crop
- Check attack of the birds
- Check weather at your field



iMETOS Tracker

iMETOS Tracker is an automatic tracking system used on self propelled vehicles and farm machinery like tractors or combines. It needs to be connected to the machine power supply to operate.

This is what you get:

- A detailed activity report about where, when and how much the machine has been running.
- Current positions of all active machines.
- Enhanced work planning.
- Automatic theft control of assets by geo-fence.



Dualex – Portable Nutrient Measurement

A handy measuring device for determining the nitrogen supply of plants.

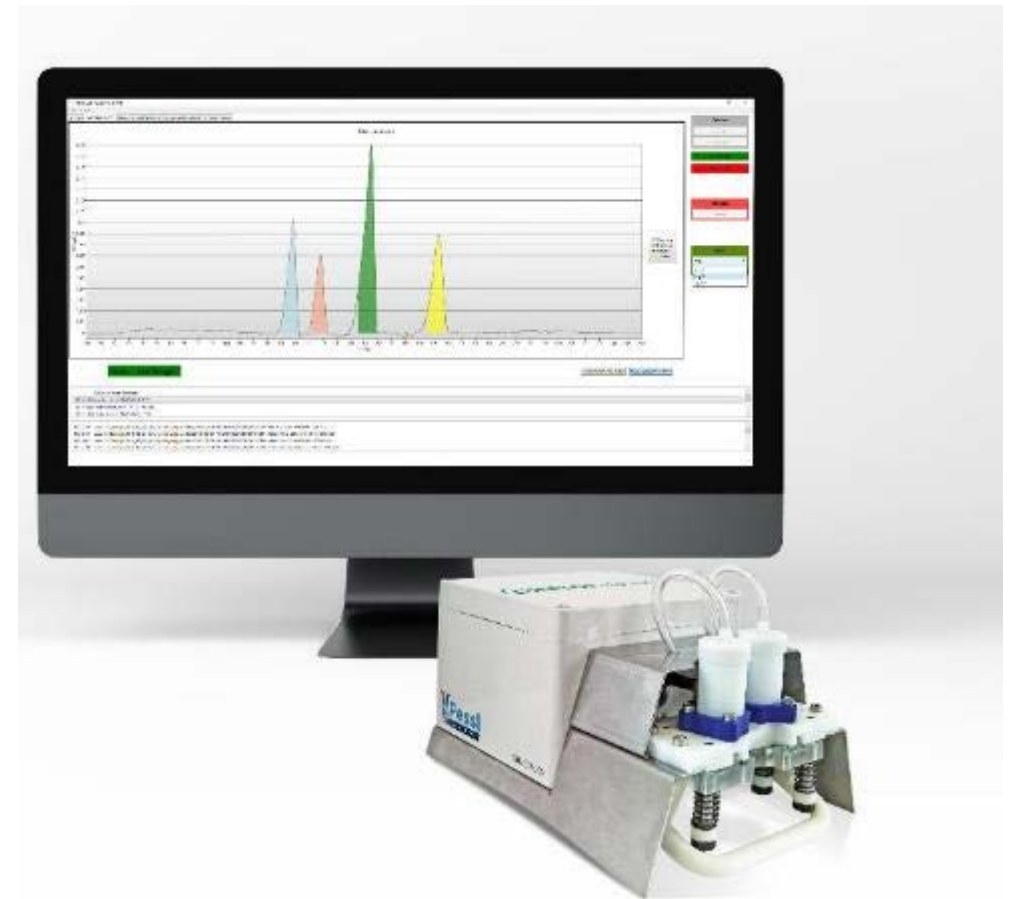
- A useful addition to the NDVI map and variable Application
- It is comparable to the devices from Yara, Minolta and Apogee

The device measures the chlorophyll, flavonoid and anthocyanin content and the GPS position. An index value (NBI) is calculated from the measured values, which allows the data to be easily compared.

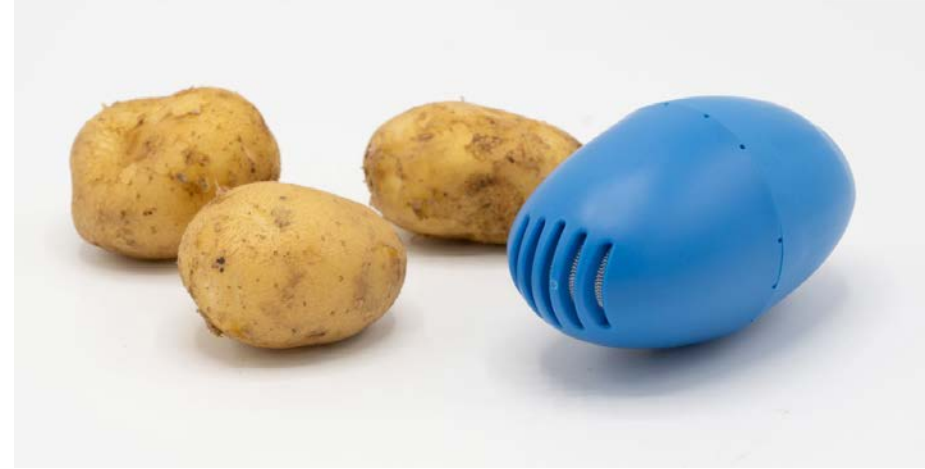


iMETOS MobiLab

- The iMETOS MobiLab is ideal as a mobile plant sap laboratory!
- The measurement of the extract is thus possible on site
- Currently, this can be used to: NO_3^- , NO_2^- , NH_4^+ , PO_4^{2-} , K^+ (NPK) and Na^+ , Cl^- , SO_4^{2-} , Mg^{2+} , Ca^{2+} in a single pass ($t < 8 \text{ min}$)
- Iron (Fe), zinc (Zn), manganese (Mn) and bromine (B) are in preparation



SolAntenna



- SolAntenna is an IoT device that tracks the temperature, humidity and CO2 levels real time in the storage
- Designed to help to optimize storage conditions
- Originally for the potato market, further applications will follow
- Based on a proprietary LoRa system
- SolAntenna was designed and launched by Solentum, first units are already in use at customers

**TURNING INFORMATION
INTO PROFIT**

Efficiency of using Diseases model

Root zone soil moisture is the CROPS GAS GAUGE for yield potential

- Field specific weather solutions are required for proper disease modelling and assessing changing risk levels
- The number of spray applications is dependent on the levels of inoculum, variety susceptibility, type of product and environmental conditions
- The spray interval can vary substantially based on field level weather conditions and can vary from 6 to 15 days, with the worst conditions occurring with moderate temperatures and high humidity levels.
- Shorten or stretch your spray interval based on field specific conditions, which either protects the plant or reduces the amount of product and application cost

EXAMPLE

- ✓ Reduce one spray for a 300 acre crop.
- ✓ Price per application/acre \$19.
- ✓ This results in a \$5,700 savings on 300 acres.
- ✓ IoT solution investment of \$1,500

Return on Investment 4:1



Efficiency of using Irrigation management

Root zone soil moisture is the CROPS GAS GAUGE for yield potential

- Soil moisture has the most significant impact on potato yields, more so than on many other crops
- Targeted irrigation can increase yield and quality, while saving water and nutrients costs
- Previous studies have shown that yields can increase by 10 to 12% by improving soil moisture levels from 55 to 75% of FC, which is potentially more than a 8:1 return on investment
- Save resources and money by more efficient irrigation management

Example:

- 10% increase in potato yields on a 300 acre crop
- Price per CWT: \$11.70.
- This resulted in a \$375 increase per acre
- \$112,500 gross return on a IoT solution investment of \$10,000

Return on Investment 10:1



METOS®

Thank you for your attention!



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