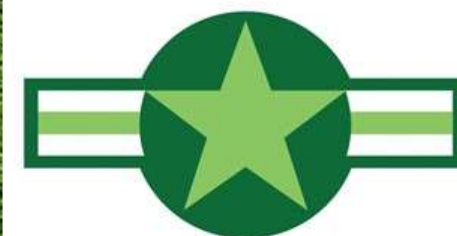


The “GREEN GO” case study



GREEN GO

The starting point

- A niche of agronomy: sports turf (stadia, golfs, etc.)
- Difficult and varying microclimates
- Very exacting customers
- Clients scattered across Europe
- Difficult to monitor microclimate
- “Precision farming” is the future...



**IDEA: DEVELOP OUR OWN
PORTABLE WEATHER STATION**



**WHERE TO START ??
WE ARE AGRONOMISTS...**



- Met the **Peccioli RIF** through **Technodeal + SSSUP**
- Attended **ECHORD++** launch meeting: 9/2/2015
- RIF put me in touch with developers (Jan-Jun 2016)
 - *Engineering*
 - *Software*
- **OUR BRIEF TO THEM**
 - Portable (“need to monitor different areas”)
 - Not plugged-into electric mains
 - Geolocalised (“what is the station monitoring right now?”)
 - Rugged and fool proof
 - Smartphone \ tablet \ PC remote access to data



ENGINEERING

Assimilate brief
Select sensors
Power supply
Develop motherboard
(Arduino-based)
DTP and GPRS module
→ **Prototype**

AGRONOMICS (A.I.)

End-user survey
Development of brief
Agronomical Intelligence
Integration
Testing onsite



IT and SOFTWARE

Assimilate brief
Online geolocalisation
Graphics and GUI
Cloud data processing
Backoffice access
→ **Beta system**

WHAT INFO DOES IT GIVE YOU ?

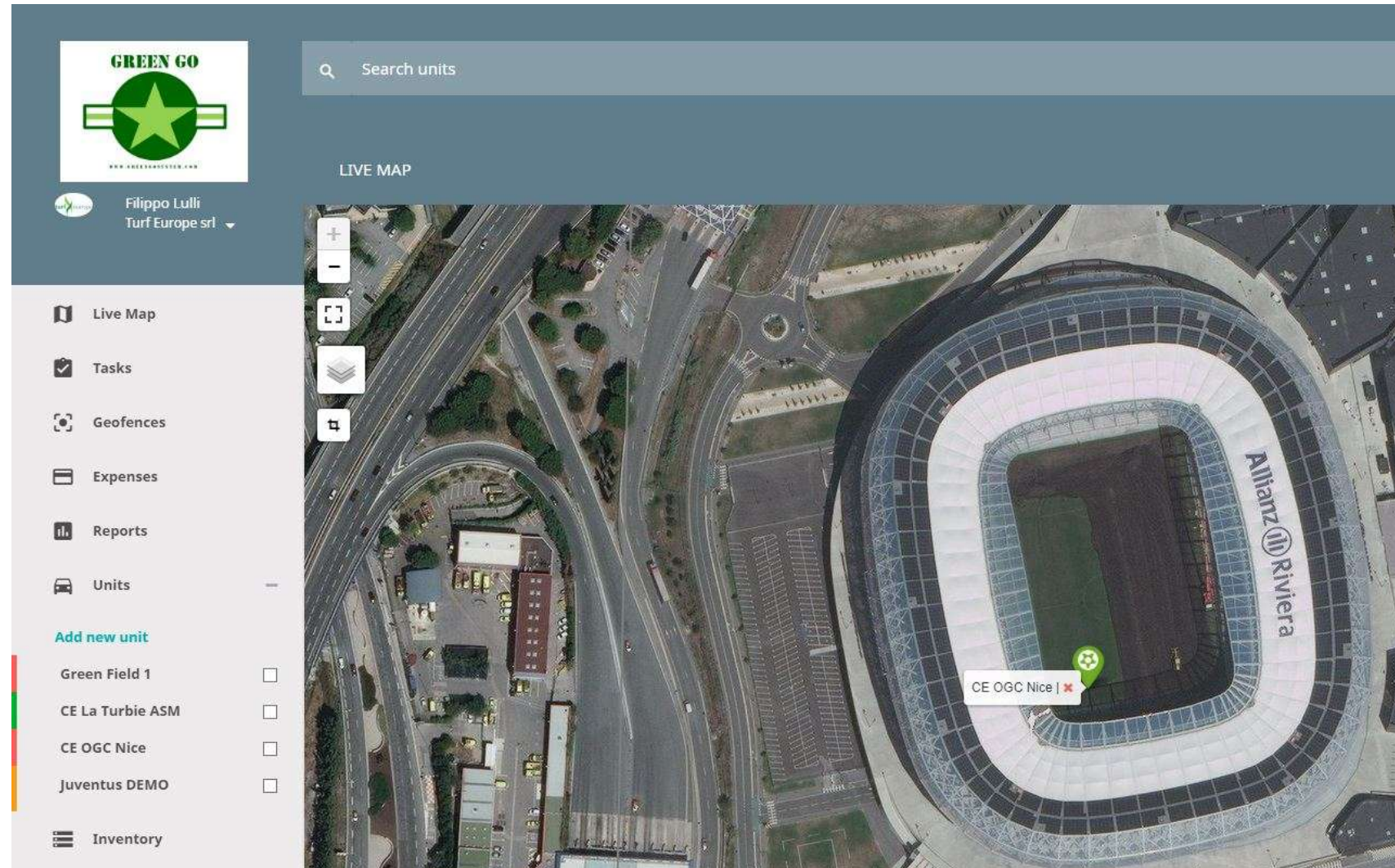
Parameters

Soil	MEASURED: Temperature, volumetric water content, EC CALCULATED: available water content
Air	Temperature, humidity, pressure, vapour pressure
Wind	Speed, direction.
Light	MEASURED: photosynthetically active radiation ($\mu\text{mol}/\text{m}^2/\text{s}$) CALCULATED: Daily Light Integral ($\text{mol}/\text{m}^2/\text{d}$)
Canopy	Evapotranspiration (mm/d)

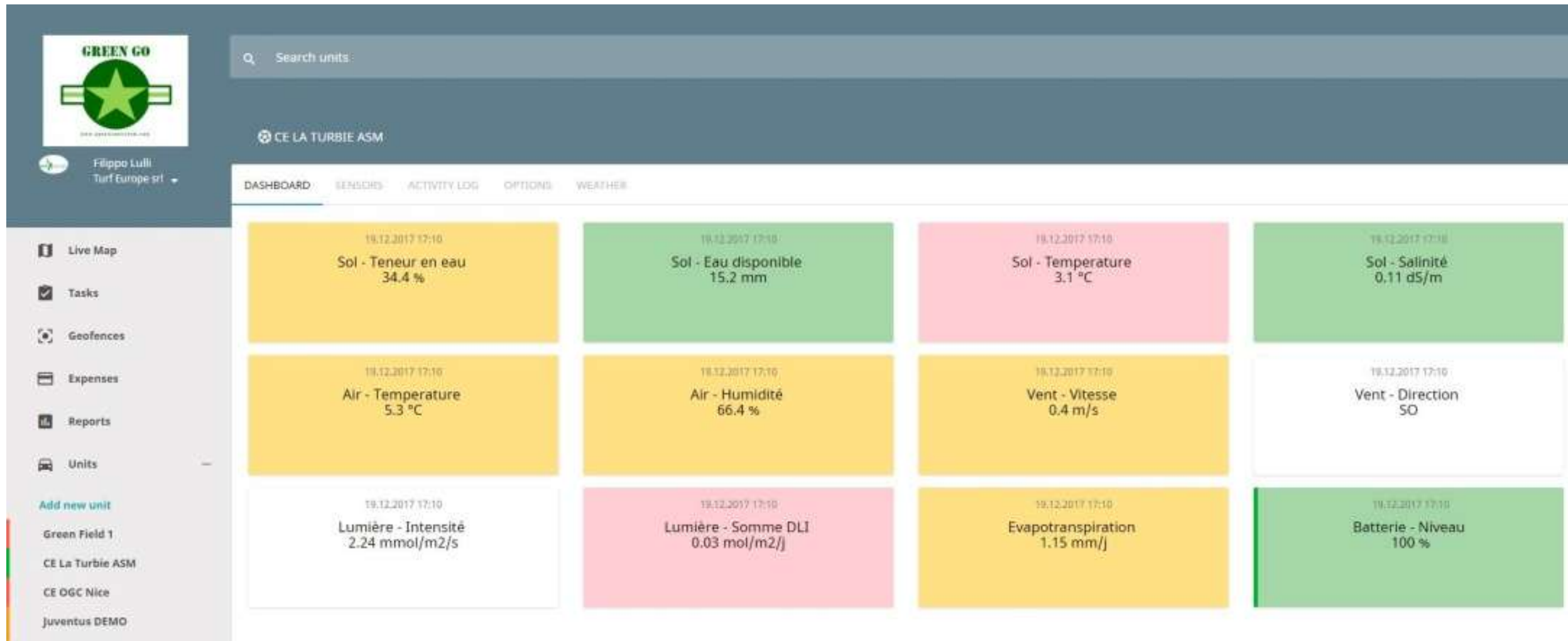


Where is my Green-GO right now?

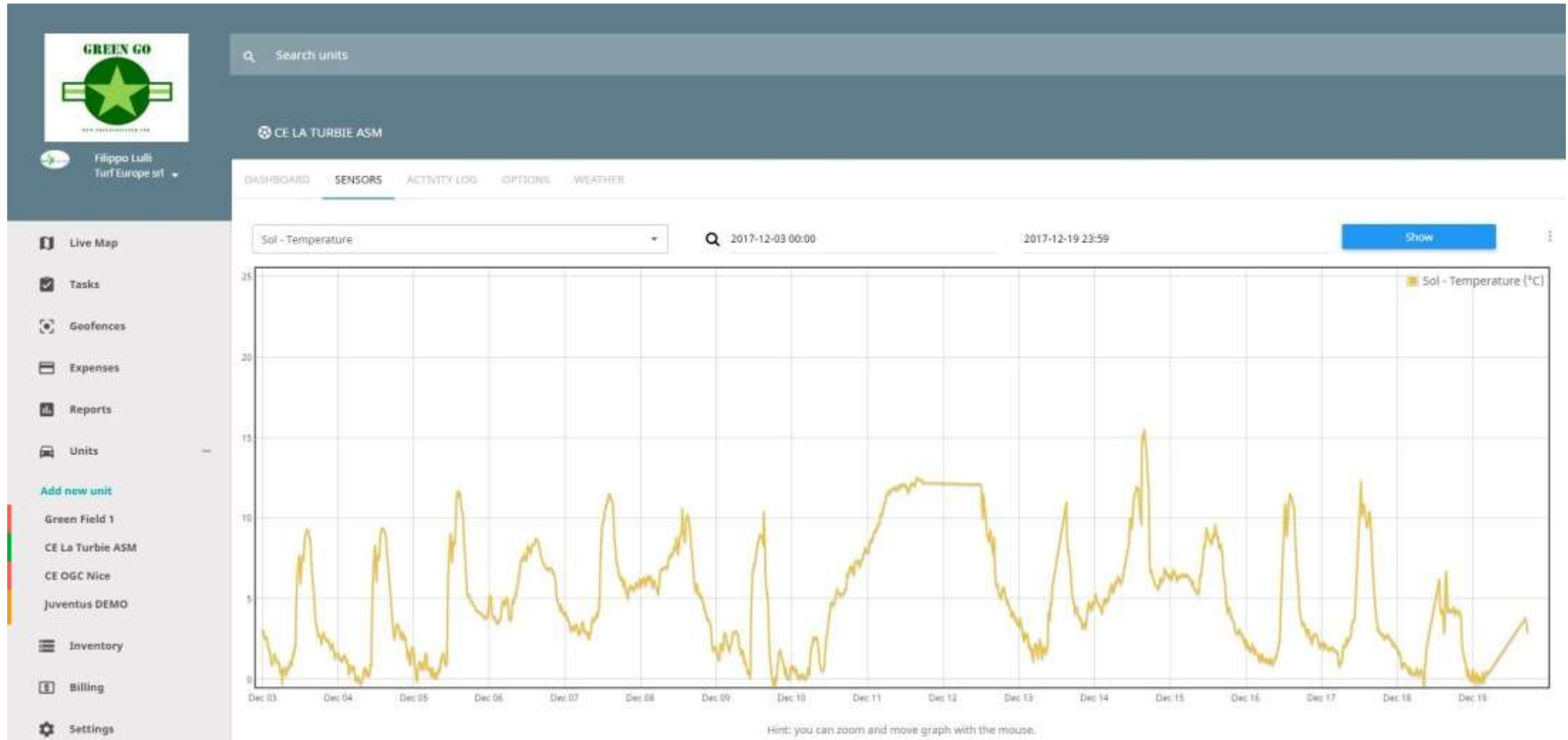
In the sun or in the shade...?



The screenshot displays the GREEN GO web application interface. At the top left is the GREEN GO logo. Below it, the user profile for Filippo Lulli at Turf Europe srl is shown. A sidebar on the left contains navigation links: Live Map, Tasks, Geofences, Expenses, Reports, Units, Add new unit, and Inventory. The main area features a 'LIVE MAP' section with a search bar and a map of the Allianz Riviera stadium. A green pin with a recycling symbol is placed on the stadium's pitch, with a tooltip indicating 'CE OGC Nice'. Map controls like zoom in/out and full screen are visible on the left side of the map.

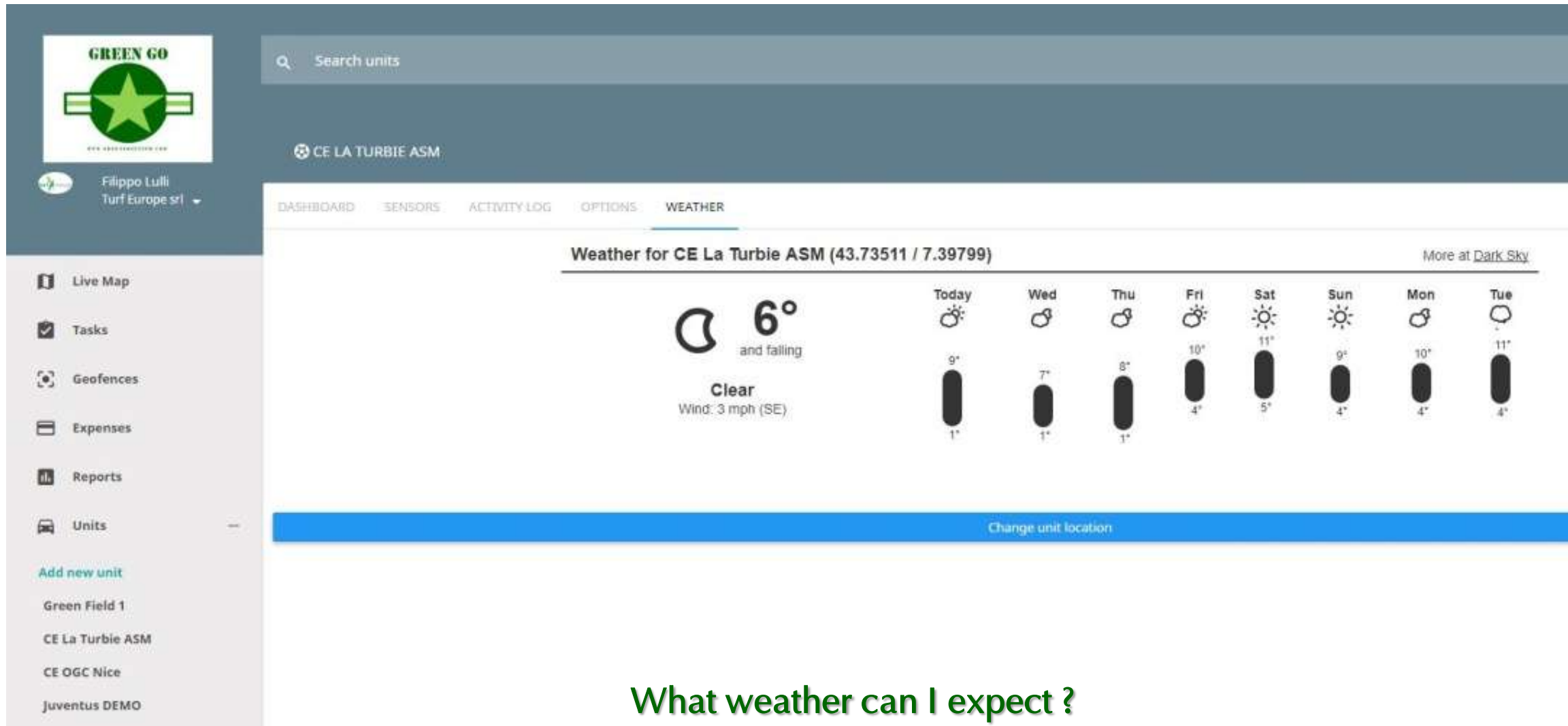


What's the situation on my pitch ?



What's my historical data ?

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What weather can I expect ?

PLAN OR RECORD

Fertilizations

Biostimulants

Maintenance work

Irrigation

Chemical pest control


Geolocalized pest log

Performance parameters

Soil\Water analysis

results

FULL LOG



Filippo Lulli
Turf Europe srl

Search units

GREEN FIELD 1

SENSORS ACTIVITY LOG OPTIONS WEATHER

FERTILIZATION OTHERS AGRONOMICAL IRRIGATION PITCH CONDITIONING PEST FUNGICIDES INSECTICIDES PERFORMANCE SOIL ANALYSIS WATER ANALYSIS

2017-12-05 2017-12-19 Search

Type to search in results

DATE	FERTILIZER	AMOUNT kg	SURFACE m2	N kg	P2O5 kg	K2O kg	FE kg	CAO kg	MGO kg	STATUS
06.12.2017	12-12-8	150.00	8000	18	18	12	0	0	0	completed
08.12.2017	6-12-6	50.00	8000	3	6	3	0	7.1	0.8	completed
12.12.2017	NovaTec Pro	150.00	8000	21	10.5	21	0.1	0	3	planned
19.12.2017	Floranid Twin Eagle K	150.00	8000	18	7.5	36	0.8	0	3	planned
Total:				21	24	15	0	7.1	0.8	

Live Map

Tasks

Geofences

Expenses

Reports

Units

Add new unit

Green Field 1

CE La Turbie ASM

CE OGC Nice

Juventus DEMO



First customers (2017)



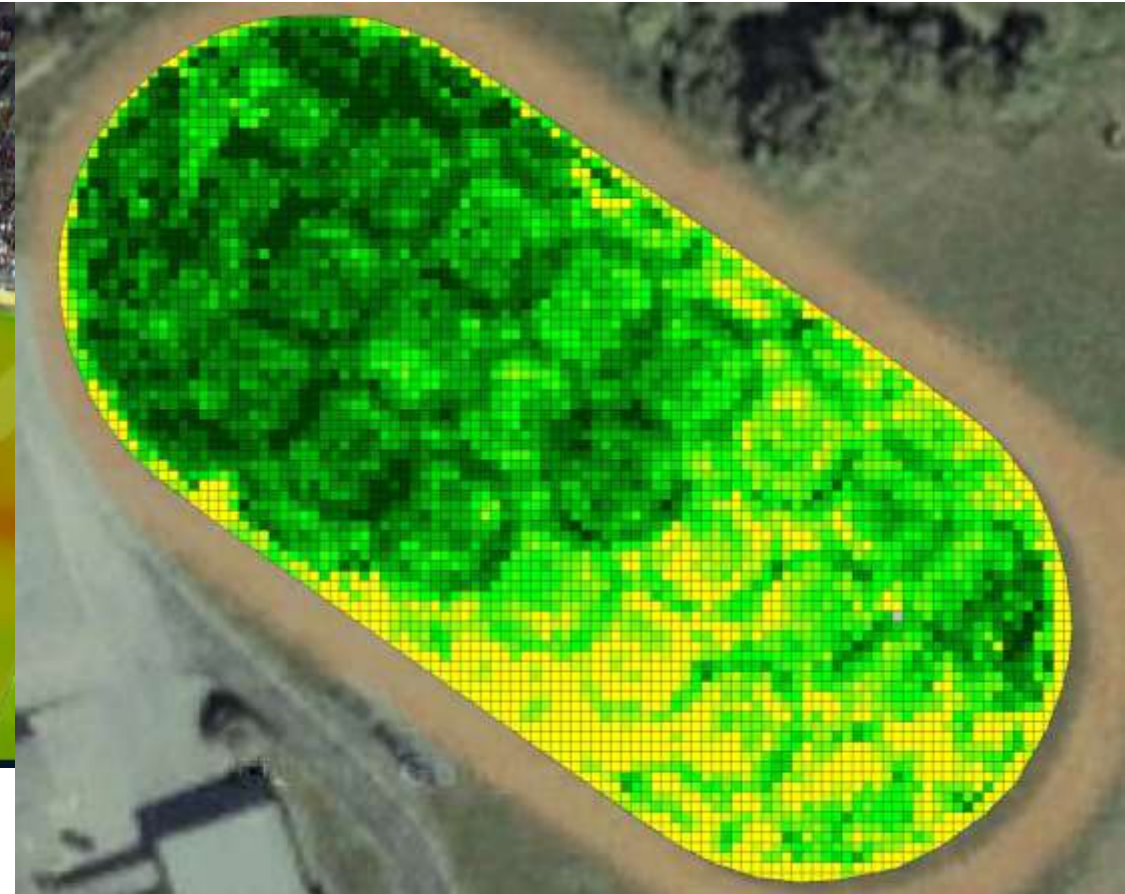
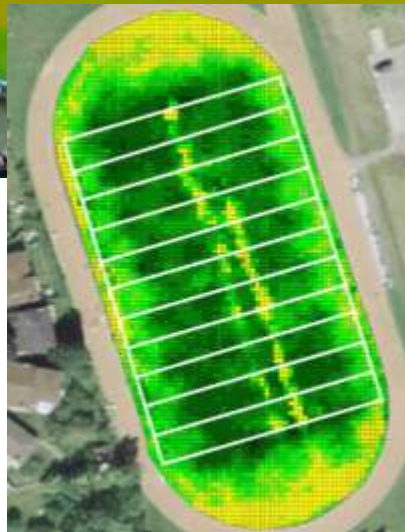
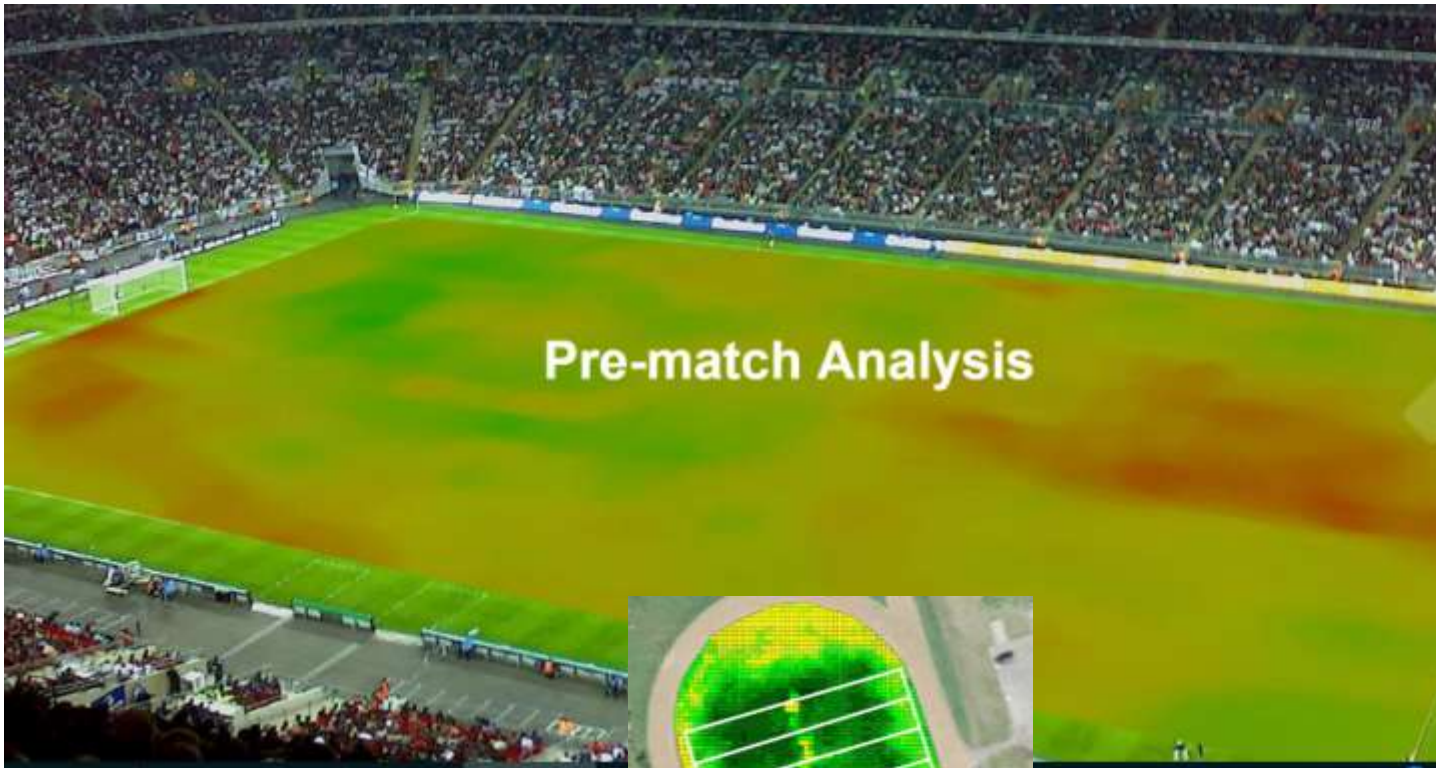
In talks with
Real Madrid FC

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The future (2018-19)

- Won Tuscany Region funding
- **“Green-GO” Project** – SME type
- 0,4 M€ over 2 years
- Robotization of the device
- Solar powering (no recharging)
- Rain meter
- Adaptation to field agriculture
- Further develop algorithms
- Automatic mapping
- Return to docking station
- Sales target: 50+ units/year





Remote NDVI and IR imagery



New light-supplying devices

Automation of biomechanics testing

Athlete-surface interaction
Ball-surface interaction



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THANK YOU !

