

plovium®

The problem



70% of the available water is used by agriculture *

65% of it is wasted *

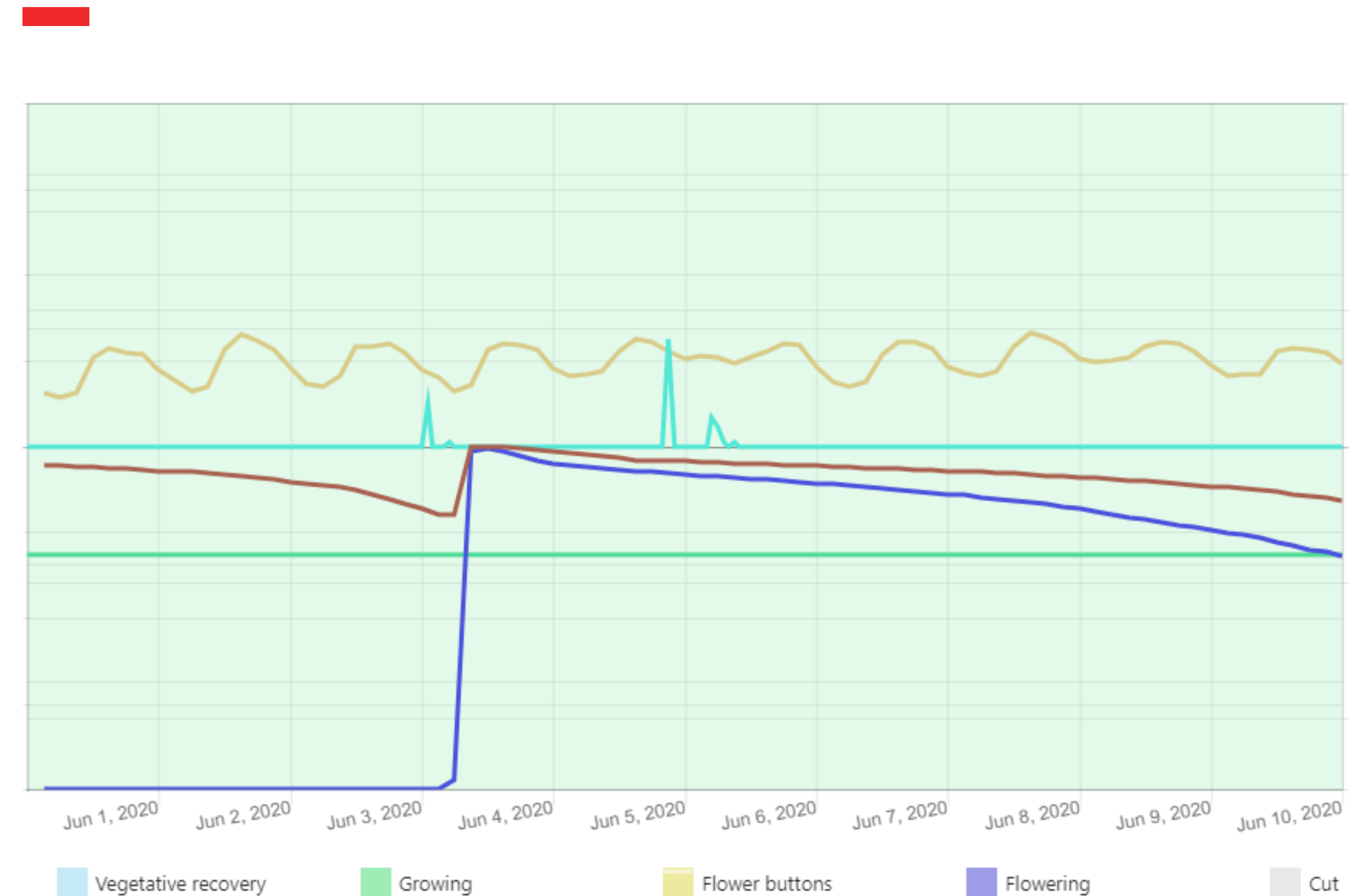
*FAO data

Waste occurs because traditional (reactive) irrigation schemes are no longer valid

The solution

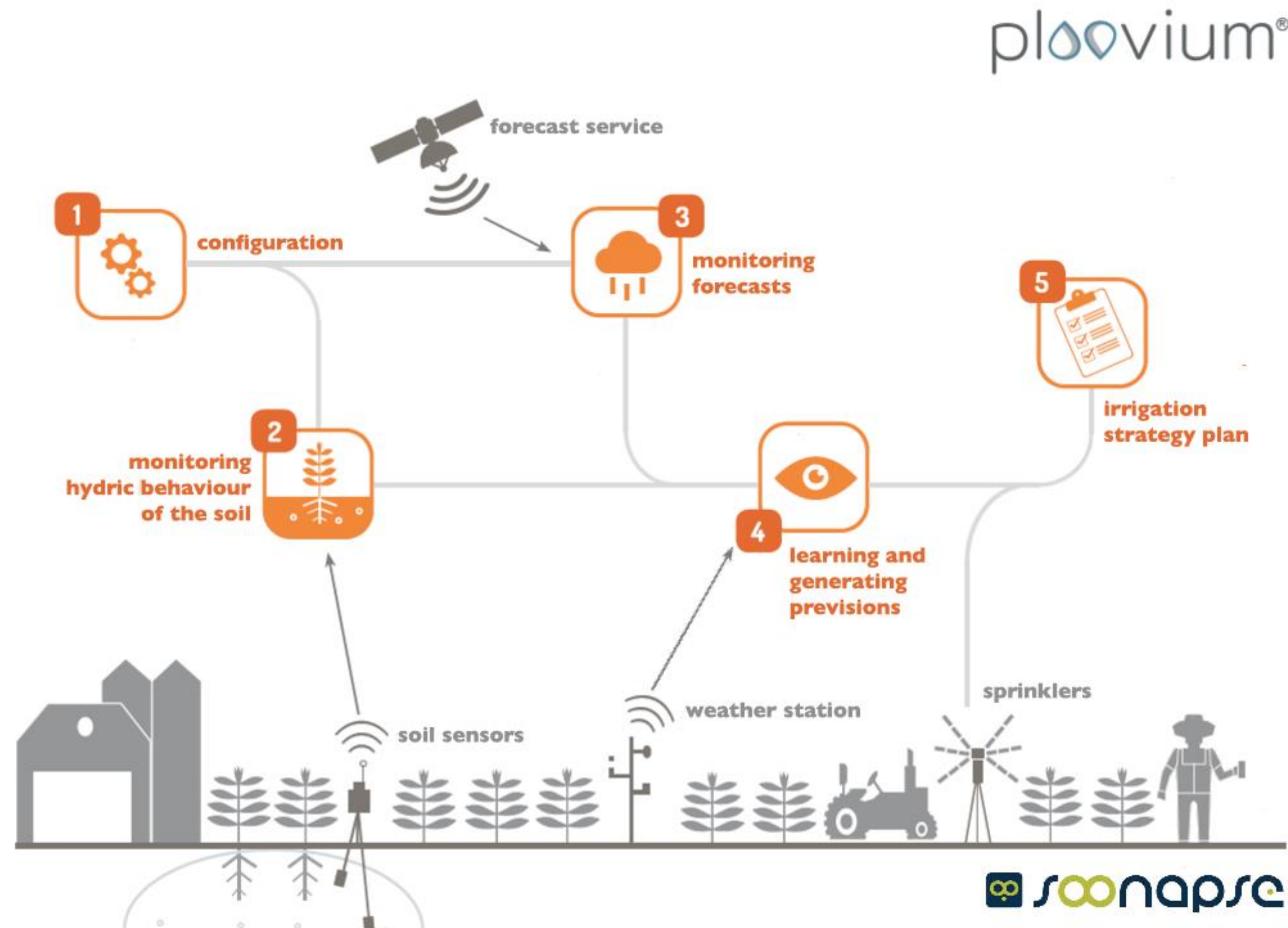
Know in real time the water behavior of the "soil / crop" system and predict exactly when it is about to enter into water stress, in order to plan the irrigation intervention safely and in advance.

Ploovium® is a software application able to predict the real need for irrigation 5 days in advance with over 99% reliability and water and cost savings of up to 50%.



How Ploovium works

starting from context data and the analysis of typical events of the functional domain, optimization and the use of (limited) resources are managed in a predictive manner.

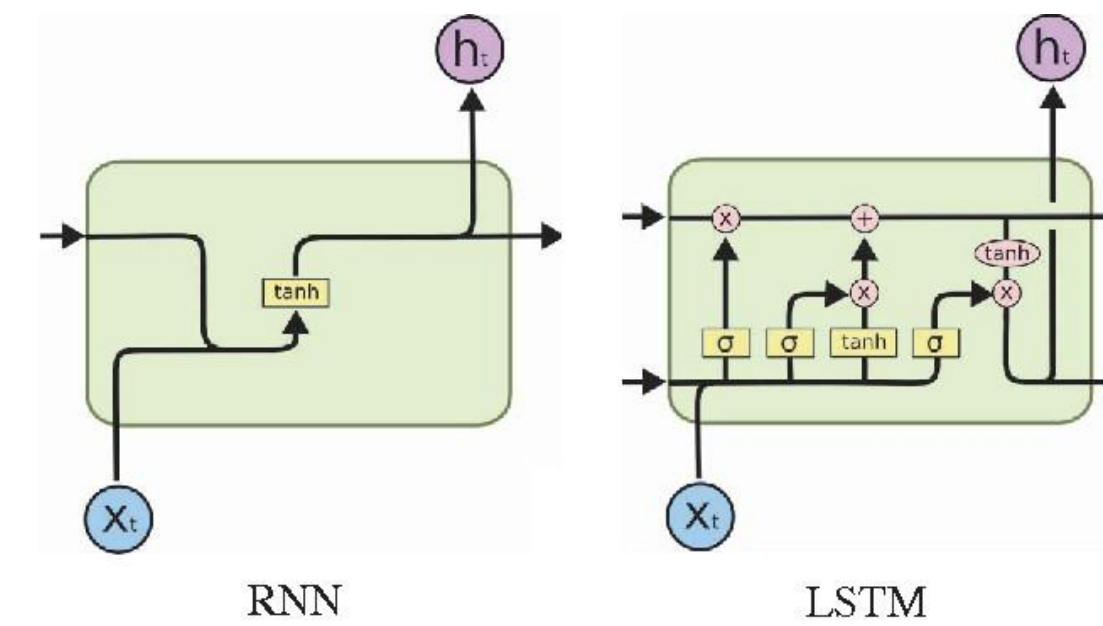


AI tools

The core of the AI module of PLOOVIIUM® is characterized by a separation approach in 2 sub-problems: soil water balance modelling and data analysis for the production of irrigation advice. The tools used are:

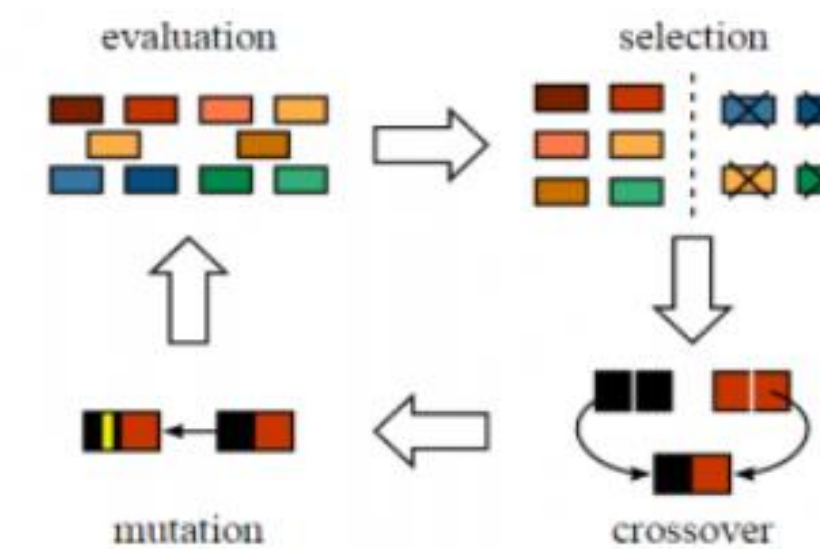
Random Forest and Recurrent Neural Network

- Soil water balancing models



Genetic Algorithm

- Irrigation advices



The Patent

The Ploovium® AI methods and algorithms are patented in Italy (N. 102019000009735) and filed in the U.S., Europe, India and Israel

The Patent, titled "*System for optimizing the use of water in irrigation based on the predictive calculation of the soil's water potential*", was awarded **triple recognition** of novelty, inventiveness and industrial applicability by EPO for **all of its 11 claims**.

The Patent is the first European one (previous ones came from the US, Israel and China), and it is simultaneously a patent on Smart Irrigation and on Artificial Intelligence application methods.

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

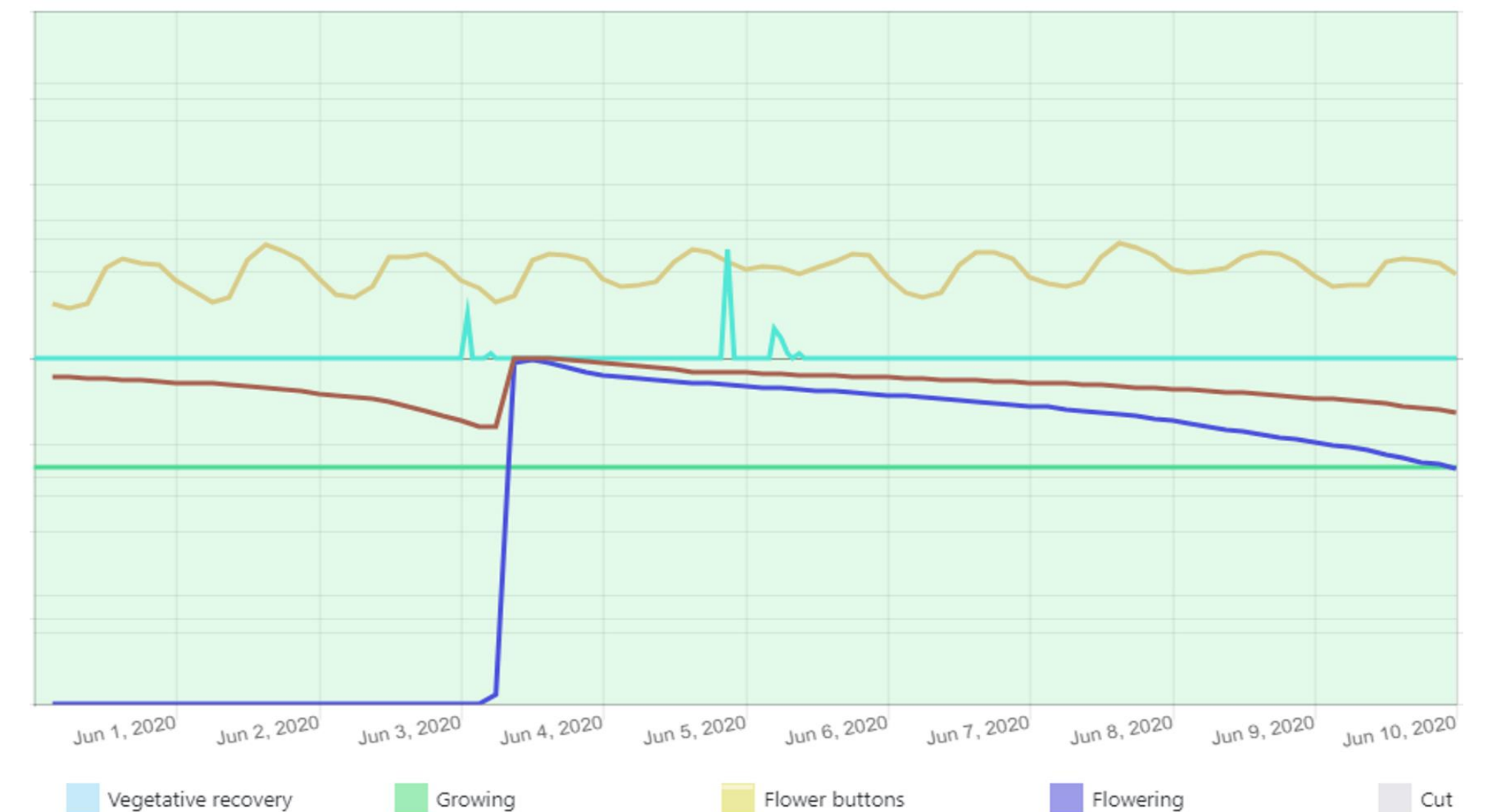
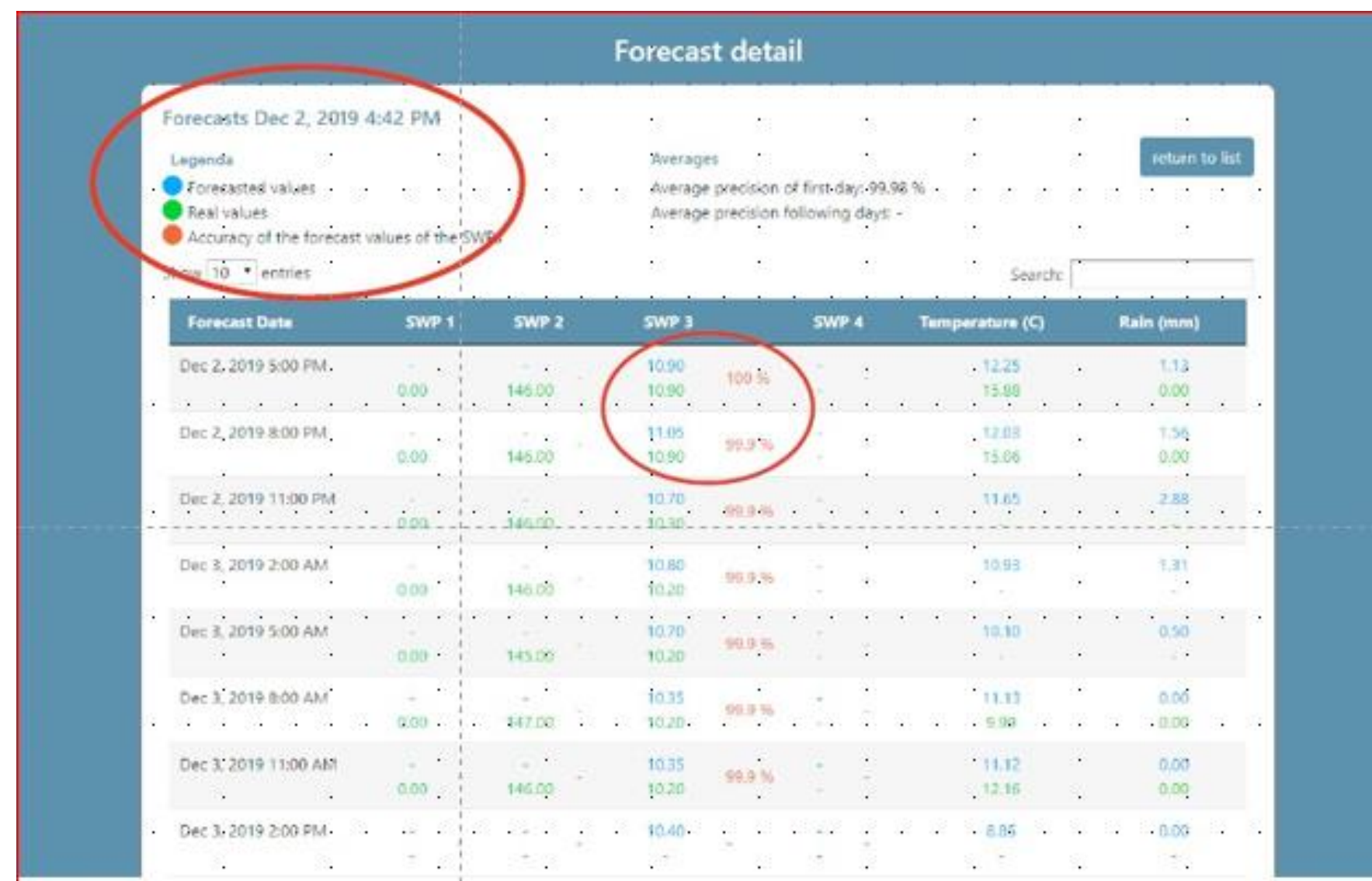
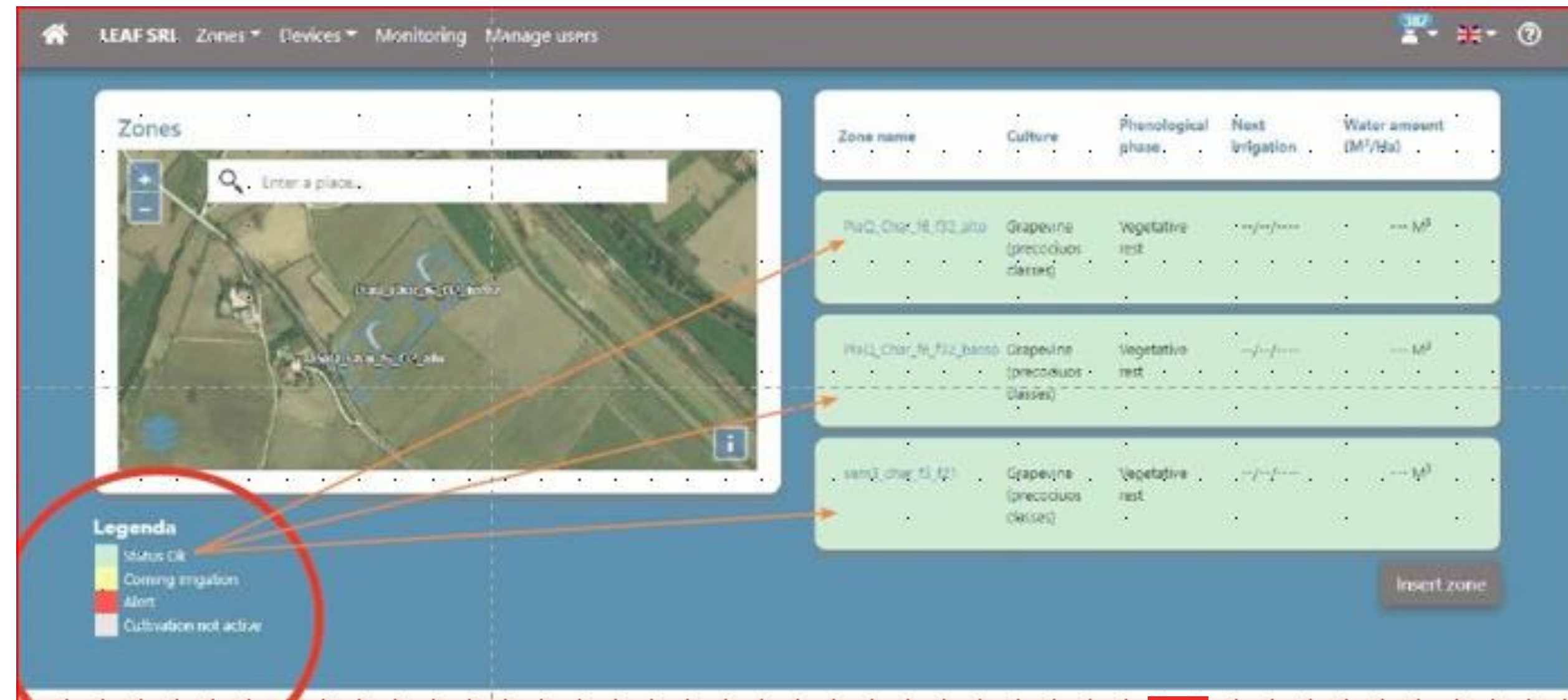
International application No. PCT/IB2020/055684

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	<u>1-11</u>
	No: Claims	
Inventive step (IS)	Yes: Claims	<u>1-11</u>
	No: Claims	
Industrial applicability (IA)	Yes: Claims	<u>1-11</u>
	No: Claims	

How irrigation is monitored



The (third parties) IoT device used



One of the dataloggers installed in a Chardonnay vineyard at Arnaldo Caprai in Umbria, Italy.



The typical Meteo Station we use in the farms.



The standard sensors we use to measure soil water potential at the average range.



Additional sensors used for expanded hydric stress control (high levels of kpa) for quality wine makers.

The founding team



Marco, CEO, founder of Soonapse and creator of Ploovium, with over 30 years of experience in the ICT sector.



Gianfranco, President, founder with over 40 years of experience in the ICT sector and over 20 years as an entrepreneur.



Stefano, Technical Director, founder with over 30 years of experience in the ICT sector



Cosmo, CMO, founder with over 30 years of experience in the ICT sector and over 15 years as an entrepreneur.

International positioning

WORLD AGRI-TECH INNOVATION SUMMIT

Start-Up Community

Robotics, Mechanization & Equipment

Soil Health

Irrigation/Water Management

Farm Management/Software

Field Monitoring/Sensing & IoT

Advanced Breeding (Seeds)

Biotech

Fintech/Traceability

Animal Ag

Chemical

Indoor

Agribusiness Marketplace

The image displays a grid of logos for various agricultural technology companies, categorized into sectors. The plovium logo is circled in the Farm Management/Software section. A blue arrow points from the plovium logo to the Biotech section.

Soil Health: AmebaGone, bontera bioAg, css, fyteko, GREENBACK, growcentia, soilsessionals, STENON, NOVIHUM, Terviva.

Irrigation/Water Management: AQUA4D, Groguru, KILIMO, CBASEMENTES, MOASIS, CORDOBA TECHNOLOGIES, Ecospray, MagGrow, Raks, Rezatec, WaterBit.

Farm Management/Software: agrivi, Agroptima, aWhere, AgSquared, ARTEMIS, Agritask, FARM DOG, FluroSat, Fresh Agriculture Technologies, frontalrain, kakaxi, UNFARM, SENSATECH, skudu, tarvos, teralytic, Sensilize, THE YIELD, TieUpFARMING, Tillo.app, wiseCROP, VITAL FIELDS.

Advanced Breeding (Seeds): Agribody Technologies, Inc., BIOHEURIS, hi-phen, KULTEVAT, PlantArcBio, PLANTEDIT, PLATFORM GENETICS, Rootility, Solynta.

Biotech: agrimetis, AGRI-NEO, AGRAGENE, ARBIOM, azotic, BVT, BENSON HILL BIOSYSTEMS, BioConsortia, biolumic, BIOECOPEST, BOOST BIOMES, CatalystAgTech, collectis, Ceradis Crop Protection, Crop Intellect, EQUINOM, evologic, FOLIUM Science, micropep, iden, MicroGen Biotech, N2 Applied, PEBBLELABS, morflora, NewLeaf symbiotics, Pherynom, Saturas, Saturn Bioponics, PLANTRESPONSE, VALOYA, TRACE GENOMICS, WeedOUT, VESTARON.

Robotics, Mechanization & Equipment: AIRINOV, Aerobotics, BLUE RIVER TECHNOLOGY, CERESCON, Dynium Robot, DryGear, ecorobotix, ForceA, efarmer, edete, GrainSense, Grassometer, KIWI TECHNOLOGIES, oddobot, rootwave, METOMOTION, ROWBOT, SAGA ROBOTICS, SOILSTEAM.COM, SKYX.

Soil Health: AmebaGone, bontera bioAg, css, fyteko, GREENBACK, growcentia, soilsessionals, STENON, NOVIHUM, Terviva.

Irrigation/Water Management: AQUA4D, Groguru, KILIMO, CBASEMENTES, MOASIS, CORDOBA TECHNOLOGIES, Ecospray, MagGrow, Raks, Rezatec, WaterBit.

Farm Management/Software: agrivi, Agroptima, aWhere, AgSquared, ARTEMIS, Agritask, FARM DOG, FluroSat, Fresh Agriculture Technologies, frontalrain, kakaxi, UNFARM, SENSATECH, skudu, tarvos, teralytic, Sensilize, THE YIELD, TieUpFARMING, Tillo.app, wiseCROP, VITAL FIELDS.

Advanced Breeding (Seeds): Agribody Technologies, Inc., BIOHEURIS, hi-phen, KULTEVAT, PlantArcBio, PLANTEDIT, PLATFORM GENETICS, Rootility, Solynta.

Biotech: agrimetis, AGRI-NEO, AGRAGENE, ARBIOM, azotic, BVT, BENSON HILL BIOSYSTEMS, BioConsortia, biolumic, BIOECOPEST, BOOST BIOMES, CatalystAgTech, collectis, Ceradis Crop Protection, Crop Intellect, EQUINOM, evologic, FOLIUM Science, micropep, iden, MicroGen Biotech, N2 Applied, PEBBLELABS, morflora, NewLeaf symbiotics, Pherynom, Saturas, Saturn Bioponics, PLANTRESPONSE, VALOYA, TRACE GENOMICS, WeedOUT, VESTARON.

Fintech/Traceability: ANIKA, CONNECTING FOOD, DIGIRODEO, STRELLA BIOTECHNOLOGY.

Animal Ag: Bee Sharing, Dalar, Chalante, nexsteppe, Cattle Care, ICownect, YLive, Ynsect.

Field Monitoring/Sensing & IoT: ApisProtect, GAMAYA, Fauna Photonics, FARMBOT, GeoPard Agriculture, GeoVisual, hiber, HydroBio, IWN, Nofence, Soiltech, visual, VULTUS, WeatherSafe, Vinsight.

Advanced Breeding (Seeds): Agribody Technologies, Inc., BIOHEURIS, hi-phen, KULTEVAT, PlantArcBio, PLANTEDIT, PLATFORM GENETICS, Rootility, Solynta.

Biotech: agrimetis, AGRI-NEO, AGRAGENE, ARBIOM, azotic, BVT, BENSON HILL BIOSYSTEMS, BioConsortia, biolumic, BIOECOPEST, BOOST BIOMES, CatalystAgTech, collectis, Ceradis Crop Protection, Crop Intellect, EQUINOM, evologic, FOLIUM Science, micropep, iden, MicroGen Biotech, N2 Applied, PEBBLELABS, morflora, NewLeaf symbiotics, Pherynom, Saturas, Saturn Bioponics, PLANTRESPONSE, VALOYA, TRACE GENOMICS, WeedOUT, VESTARON.

Agribusiness Marketplace: agtools, InstaAgro.com.

Chemical: exosect.

Indoor: AeroFarms, URBAN CROP SOLUTIONS.

Main awards and acknowledgments



Some Customers



3 agriculture zones
Grapewine (for wine production)



2 agriculture zones
Dry Rice



17 agriculture zones in 2 plants
Cardoon, Melon, Zucchini, Cabbage, Cynodon dactylon L., Safflower



12 agriculture zones
Field bean, Tomato, Potato, Corn



4 agriculture zones in 2 plants
Rosemary, Lavender, Lettuce, Valerianella

A scientific paper by CREA and UNIFI claims that the Ploovium adoption brings better production and costs savings.

Unique Selling Points

- Plug&Play solution
- Any soil texture, any crop, any geography
- Hardware independent
- Innovation at 300€/year, linked to the irrigation zone, not to the HAs



Payback

Example: a small farm with two corn fields of 20 HA each, located in Italy

	Ploovium® costs		Irrigation costs		Savings with Ploovium®: 30%	Balance
Year 1: Project startup	1 Meteo station (including connectivity costs for 4 years)	€ 1.850,00	Water (an average of 3,600 cubic meters per HA per season, at a cost of 0.21€/M3)	€ 30.240,00		
	2 Datalogger with soil sensors (including connectivity costs for 4 years)	€ 2.600,00	Irrigation overhead costs (personnel, fuel, electricity, etc...)	€ 7.500,00		
	2 Ploovium® subscription	€ 600,00				
	Total	€ 5.050,00	Total	€ 37.740,00	€ 11.322,00	€ 6.272,00
Following years	1 Meteo station (including connectivity costs for 4 years)	€ 0,00	Water (an average of 3,600 cubic meters per HA per season, at a cost of 0.21€/M3)	€ 30.240,00		
	2 Datalogger with soil sensors (including connectivity costs for 4 years)	€ 0,00	Irrigation overhead costs (personnel, fuel, electricity, etc...)	€ 7.500,00		
	2 Ploovium® subscription	€ 600,00				
	Total	€ 600,00	Total	€ 37.740,00	€ 11.322,00	€ 10.722,00



Thank you for your interest