









Our commitments

We are committed to connecting humans and plants, and to participate in the resilience of agriculture, by providing useful information to winegrowers on the state of their vines.

Listen to your crops !





At the origins of Vegetal Signals, Neuroscience



Our technology interprets biological signals into the plant to inform vine growers in real time and continuously on the state of their vineyards and develop innovative and efficient technical itineraries

Listen to you crops !

Plant electrophysiology at the heart of our technology

Determining the precise needs of a plant and supporting it as best as possible during its cycle and while respecting its terroir and its environment is a major challenge for the wine industry.

Who better than the plant can testify to its condition ?

Plant electrophysiology is a recent science. At the heart of the Phloem, at the level of membrane proteins, there is an electrical activity allowing the transport of essential molecules and the signaling of environmental stresses of biotic origin (aggressions by pathogens) or abiotic (excess or defect of light, sudden fluctuations in temperature, hypoxia, water stress, salinity, etc.).

In 2022, after 5 years of R&D, the Vegetal Signals team managed to capture, process and interpret these electrical signals to provide useful information to farmers on the physiological state of vines in real time.

vegetalsignals , our technology

Listen to you crops !

Empreinte

Technology principle fungus attack Ou Pest attack Heat waves / cold Water stress Deficiency in mineral ADP + P elements Wounding substance osmotic shock ↓H⁺ Photosynthesis ↓H^{*} H Cell K Tissue Ct Organ Nat Organization Ca2+ Electrical potentials Local electrical 30 # 4 Variation potential potential 3 ever electrical potential 20 m/V System potential 0.5 1

What distribution of electrical activity by frequency?



Example: Differentiation of vine irrigation modalities from signals in Stellenbosch - 2021



Machine Learning

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A kit ready to install in the vineyard

- 1 sensor made up of 8 pairs of electrodes
- Position of electrodes: primary branches
- Power supply: solar panel
- Data recording: micro SD card
- Data sent every 10 minutes via cellular network





20 minutes to install

Each sensor and 5

minutes to uninstall





vegetalsignals 4 services for vine growers in 1 sensor



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hydroscore

Real-time monitoring of the water status of your vines

Deseases Presymptomatic Detection mildiou



Beta test since 2022

maturity monitoring [BETA TESTING]

Beta test from 2023 Indicators : Evolution of the degree of potential alcohol, total acidity and sugar loading.

• Premium service

Tailor-made model trained on your vineyard



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hydroscore

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Bienvenue, Château Montrose

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vegetalsignals Listen to your crops

Céline MAUSSIRE Coordinator R&D Château Pichon Longueville Comtesse de Lalande Pauillac

Listen to our users !

« Over the last decade, a dynamic of excellence has been led by the team of Pichon Comtesse and technical innovations have proven to be great tools in the service of this perpetual quest. We wanted to be less interventionist on the soil, while seeking more technological precision in the collection of data.

For more than 8 years, we have already been carefully monitoring the water status of our vines at Pichon Comtesse. The new technology offered by Vegetal Signals appealed to us because it makes it possible to increase the number of measurements and reduce the difficulty of this task for our teams.

In addition to other field observations, this tool is an aid for steering our strategies of cultural practices in the vineyard in order to better adapt to global warming".

🔮 vegetalsignals



hydroscore

Calibrated with stem water potential measurements

110 plots on 3 vintages: 2020 to 2022



What's the point ?

- Real-time monitoring of the water status of the vine
- smartphone app
- History of your data
- In-app note taking

Uses cases ?

- Optimization of your irrigation according to the real needs of your vines
- Significant water savings
- Positioning of biostimulant products
- Comparison of plots
- Comparison of technical itineraries
- Monitoring of a young planted plot for which excessive water stress can be fatal or conversely too much water comfort high may affect its future resilience.



hydroscore : use case example



Merlot Plot in Marguerittes / Nîmes - South of France - Vintage 2021

10

Listen to you crops !



Mildew Presymptomatic Detection

Calibrated with health monitoring observations in the vineyard

50 plots on 2 vintages : 2021 & 2022





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What's the point ?

- Detect in real time a late blight infection before the appearance of the first visible symptoms (D-5)
- 4 feet monitored by sensor
- Smartphone app
- Alert system
- In-app note-taking

To do what ?

- Suivre la pression maladie sur un réseau de parcelles de référence (TNT ou autres)
- Réduction des premiers traitements
- Adaptation des traitements phytosanitaires en fonction de la pression



Pre-symptomatic detection of Mildew (beta-test)



Preventive treatments, but possibilities of









Time (in days)



Maturity Monitoring



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What's the point ?

- Track the maturity of your arrays in real time
- TAP, Total acidity, sugar loading speed
- Alert system
- In-app note-taking

To do what ?

- Save man time / multiplying measures
- Plan your harvest more finely
- Do not see its degree soar too quickly in a context of global warming
- Compare maturity curves from one year to the next to anticipate the profile of the vintage in the cellar





Indicators calibrated on 120 plots over 2 vintages: 2021 and 2022 7 grape varieties





Maturity monitoring model methodology

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Experimental vineyard = a network of 80 plots

40 entre-deux-mers + 40 languedoc/méditerranée

Merlot noir

Cabernet sauvignon

Cabernet franc Sauvignon blanc









+ syrah, grenache & chardonnay





16

TIME



Sugar loading

Varietals	MAPE (%)	MAE (mg / baie)
CF	6.4	14.5
CS	10.9	17.0
MT	8.3	18.7
SA	9.9	18.9
total	8.9	17.5



INFOGRAPHY 2022

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KEY STRENGTHS

- Real-time monitoring
- Continuous service (no clouds dependent)
- Non-destructive technique
- Direct approach = at the core of the plant
- 1 multiservices sensor
- Energy autonomous
- Robustness (adapted to the vineyard)
- Easy installation
- An affordable price (no equipment cost)
- Alerts and notes-taking
- Simple and intuitive interface
- Reliable and trained models
- Made in Bordeaux







Our collaborations





Coming from R&D, the company relies on a highly qualified and interdisciplinary team

Lead Models & Machine Learning



