Vivent Biosignals:
Real-time monitoring of plant responses in the lab and field

Vivent Biosignal's crop health monitoring technology, uses artificial intelligence to decipher extracellular plant electrophysiological signals. We provide real-time crop health insights and diagnose specific abiotic and biotic stressors long before visible symptoms. An intuitive, interactive dashboard ensures you can monitor, analyse and report on experiments remotely, reliably and quickly.

Early and Specific Signals

Detect stress when it happens! Real time information, so you gain insights into plant responses to a wide range of stimuli. Statistical and machine learning analytics to differentiate experimental groups.

Climate	Fungi	Insects	Drought	Nutrients	Biostimulants

Vivent Biosignals, a Swiss-based scale-up and B Corporation, is the world leader in plant electrophysiology, with powerful intellectual property including patents, highly reputable research papers, the world's largest library of data and existing algorithms for the early diagnosis of climate responses, soil pests, sucking and chewing insects on foliage, fungal and bacterial infections, water and salt stress and nutrient deficiencies.
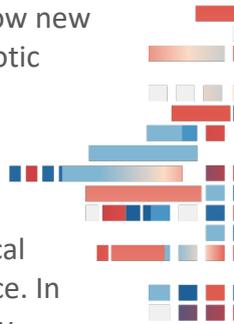
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Value for plant scientists and other researchers

Vivent Biosignal's current clients include a range of plant scientists investigating plant signalling, plant responses to a wide range of stimuli, plant:soil:microbe or disease interactions as well as applied research in breeding, cultivation and agronomic systems. We also work with companies developing biostimulants and innovative fertilisers, climate resilient varieties, new substrates etc. What they have in common is that they all are trying to find novel solutions to mitigate plant stress. With Vivent's solutions, companies can demonstrate crop protection efficacy and provide timely advice on treatments like biostimulants. R&D departments gain valuable insights into the mode of action of their products and provide improved recommendations on targeted use. Breeders can use plant signalling to support their research or understand how new varieties react to growing conditions, climate and biotic stresses.

What is crop electrophysiology?

Plants use internal electrical, mechanical and chemical signalling networks to coordinate growth and defence. In response to (a)biotic stimuli the ion channels in many individual plant cells behave similarly, producing an electrical wave characteristic of that stimuli. Advanced signal processing isolates this characteristic and provides an accurate diagnosis of the plant's condition in real time. Electrical signals are some of the fastest to spread information both locally and systemically, across the entire plant. Innovative electronics and artificial intelligence (AI), enables researchers to interpret this information and to directly measure plant health, and to assess stress prior to visible symptoms. Early diagnosis leads to insights into the timing and degree of plants' responses and effectively differentiates groups of treated and untreated or stressed and control plants.

From root to shoot: Vivent sees it all

Unlike many other plant monitoring solutions our biosensors also monitor what is happening in roots. Electrical signals are interpreted as they pass to and from the roots revealing problems in the substrate, such as fungal or nematode attacks, issues with irrigation / fertigation systems or poor soil quality.
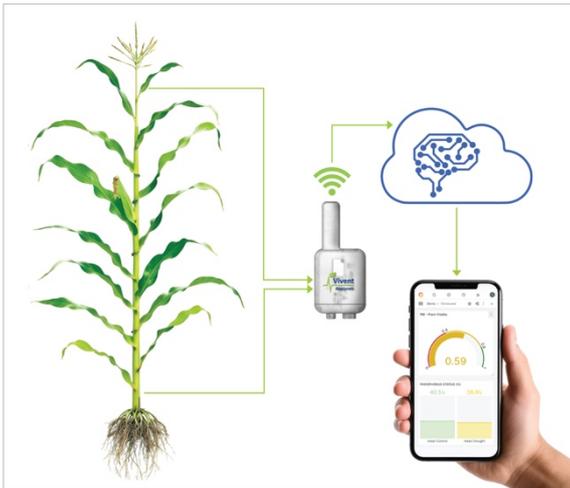
How it works

Two electrodes are attached to a plant and its natural internal signals are amplified and recorded. The electrodes typically stay in place throughout a full crop cycle. We typically deploy 2 – 4 biosensors, each monitoring 8 plants to compare treatment groups and we provide a research interface showing crop health and the presence of crop threats in real-time and on demand.

In real time, signals are compared to a library of diagnostic algorithms and plant response metrics. Algorithms include a range of abiotic stresses, such as drought, nutrient deficits (N,P,K, Ca,Fe,Mn) as well as biotic stresses including Thrips, Aphids and plant diseases such as Mildew. Response to light and water and nychthemeral rhythms are clearly visible. Results can be integrated with existing decision support tools. The efficacy of crop treatments is assessed immediately.

Activity Over Time
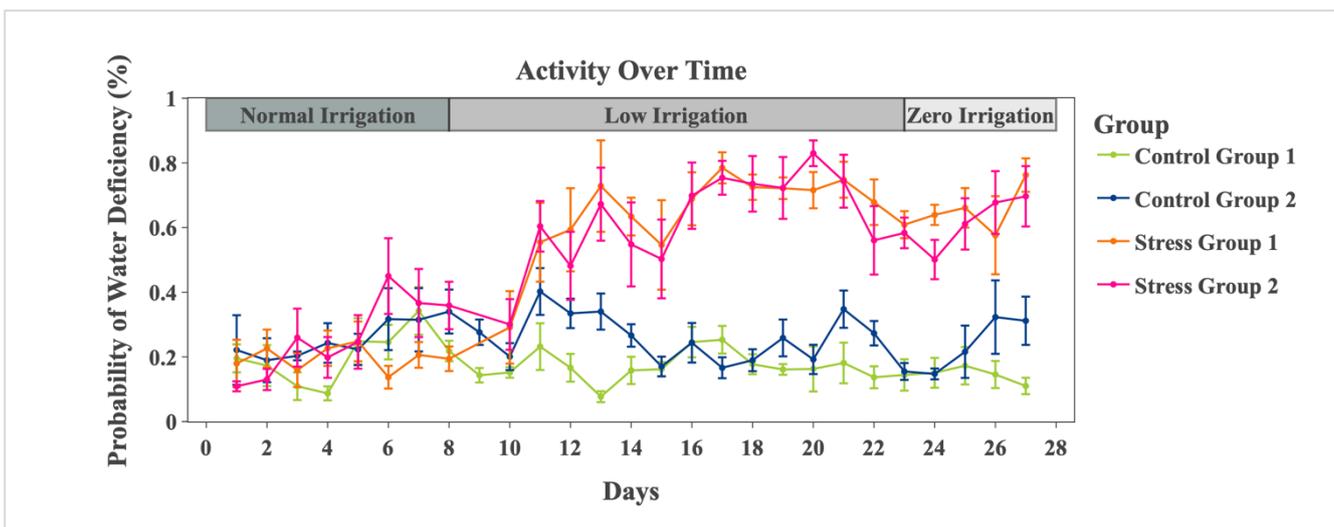
Real time information from plants

A live view of plant electrophysiology signals shows how plants are responding to current environmental conditions and when a plant reacts to a stressor, like a fungal infection or insect infestation. It also shows how the plant responds to crop protection treatments, and whether there is ongoing stress even after pathogens or insects have been successfully controlled, as in this case. This information provides valuable and convincing evidence of the efficacy of crop treatments, or how new genetics respond to specific stresses. Researchers see how and when a crop treatment works, can compare different treatments, and learn about application timing and methods.

Getting started

Are you a plant scientist interested in measuring crop health directly, or in screening or testing more sustainable crop treatments? Would you like to use Vivent's algorithms that detect stressors long before visual symptoms. Please contact us at info@vivent.ch and visit our website www.vivent.ch

Industry coverage:

horti daily
EFM
AgFUNDERNEWS
syngenta
EUROFRUIT

We work with a range of partners to accelerate product development for biostimulants, fertilizers, and innovative crop protection products. We also work with partners, who develop solutions for indoor farming, such as artificial lighting, screens, or new substrates. Plant breeders use our sensors to gather real-time information on responses of different plant varieties to specific stressors so they can quickly identify resistant varieties or develop optimal growing recipes for new products

Working with YOU – our vision

Speed up research and product development cycles;

- ✓ Quantified, real-time evidence of product efficacy for all stakeholders.
- ✓ Remote monitoring of your experiments, so you are always aware of plant responses.
- ✓ Support for compound, seed and cultivar selection e.g. drought resistance.
- ✓ Real-time insights into plants' responses to crop treatments.
- ✓ Algorithms for new pests or diseases developed and added as they arise.
- ✓ Plant stresses are diagnosed before visual symptoms.
- ✓ Experienced senior plant and data science analysts to support you.

Vivent
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A better way to understand crop health

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