Vivent: Digital crop diagnosis today & in the future

Vivent's plant diagnostic technology, uses artificial intelligence to decipher internal plant signals and provides plant health insights and diagnoses pathogens and pests, including root conditions, long before visible symptoms.

Early and Specific Signals

Detect stress when it happens! Real time instead of days or weeks when it is too late.

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Fungi

Insects

Drought

Nutrients

Biostimulants

Vivent

Vivent, 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 soil pests , sucking and chewing insects on foliage, fungal and bacterial infections, water stress and nutrient deficiencies.

Value for researchers and Agtech companies

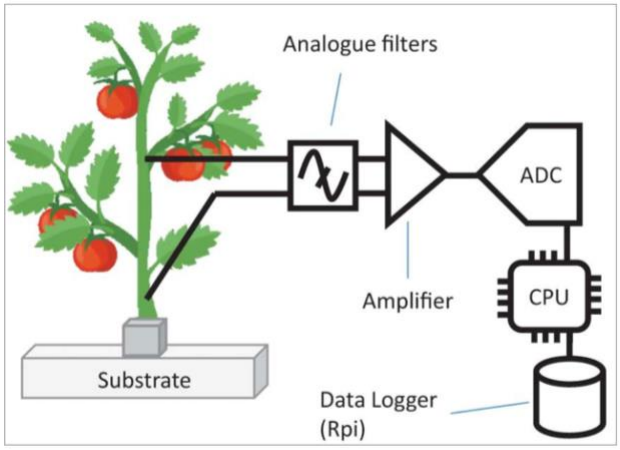
Vivent's current clients include companies working on biostimulants, new climate resilient varieties, agtech companies developing sustainable crop treatments, new substrates etc. What they have in common is that they all are trying to find new solutions to mitigate plantstress. With Vivent companies can provide evidence of crop protection effectiveness to their customers as well as timely advice on treatments like biostimulants. R&D departments can now better describe the mode of activity 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 climate stresses.

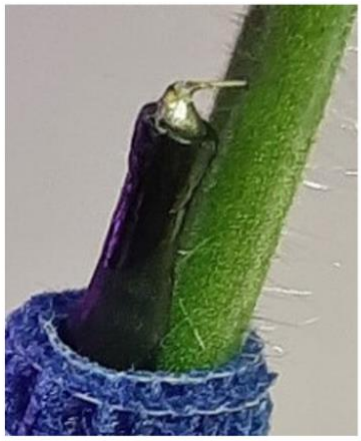
What is crop electrophysiology?

Plants use internal electrical, mechanical and chemical signalling networks to coordinate growth and defence. Electrical signals are some of the fastest to spread information across the entire plant. New technology, and artificial intelligence (AI), lets growers interpret this information to measure plant health, and to diagnose pathogens and pests prior to visible symptoms. Early diagnosis increases yields, improves crop protection effectiveness, and reduces the risk for growers of adopting environmentally preferable solutions.
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.

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, or issues with irrigation / fertigation systems.

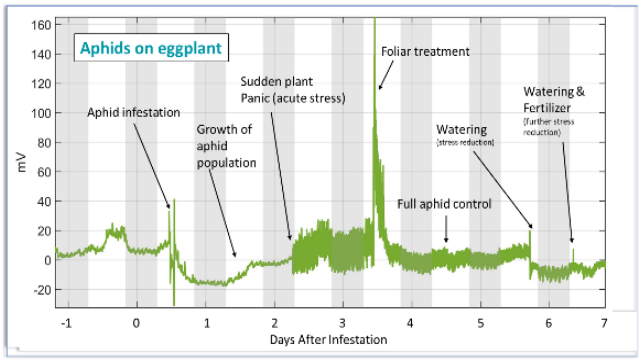




How it works

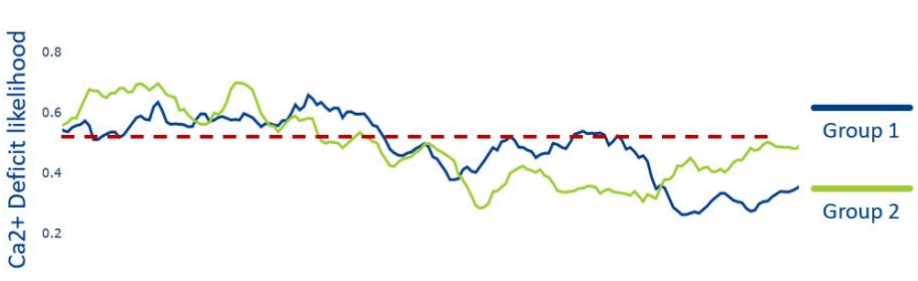
Two electrodes are attached to a plant and its natural internal signals are amplified and recorded. The electrodes typically stay in place throughout a crop cycle. We typically deploy 2 – 4 biosensors, each monitoring 8 plants to compare treatment groups and provide a research interface showing crop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

In real time, signals are compared to a library of diagnostic algorithms. Algorithms detecting a range of abiotic stresses, such as drought, nutrient deficits (N,P,Ca,Fe,Mn) and a range of biotic stresses including Nematodes, Thrips, Aphids and plant diseases such as Mildew. Results can be integrated with existing decision support tools. The efficacy of crop treatments is assessed immediately.



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 crop researcher and interested in measuring plant health directly, testing more sustainable crop treatments and want 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

We work with a range of partners on collaborative 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, 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;

- ✓ Solid- real-time evidence of product effectiveness for all stakeholders.
- ✓ Support for seed and cultivar selection e.g. drought resistance.
- ✓ Real-time insights into plants' responses to crop treatments.
- ✓ Algorithms for new pests developed and added as they arise.
- ✓ Plant stresses are diagnosed before visual symptoms.
- ✓ Experienced senior plant science support team to support you.
- ✓ Real-time alerts from the plants.

Vivent

A better way to understand crop health

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