



Campbell
S C I E N T I F I C ®

Agrivoltaic Solutions

POWERING THE FUTURE OF AGRIVOLTAICS



Leading the Charge in Agrivoltaic Innovation

Campbell Scientific is the trusted leader in both photovoltaic (PV) performance and agricultural monitoring.

Our cutting-edge hardware platform allows us to provide unmatched performance monitoring for all aspects of agrivoltaic projects. Relying on inaccurate data can lead to costly consequences, especially in precision agriculture, where a single degree of error can significantly impact crop health and reduce yield.

Campbell Scientific Agrivoltaic Monitoring System

Unmatched Expertise and Reliability in Agrivoltaic Monitoring

Our agrivoltaic solutions are built on decades of experience in environmental monitoring, combined with in-depth knowledge of the specific requirements of agrivoltaic systems. We offer a comprehensive range of sensors, data loggers, and telemetry systems specifically designed to:

- Measure soil moisture, the micro-climate under the solar panels, and other important environmental factors. Just as you wouldn't want to wear a jacket on a hot day, plants need the right amount of sunlight, water, and air to thrive. Our sensors monitor these conditions so you can make sure your crops are getting what they need.
- Track how well your crops are growing. Our comprehensive sensor suite monitors vital plant health indicators, including leaf health and fruit development, allowing for early detection of potential issues and the implementation of proactive measures to ensure optimal crop health.
- Monitor the key environmental factors impacting PV performance. Our solution measures irradiance and back-of-module temperature. While a soiling measurement system can be added to address specific needs, the core function is to track these crucial environmental parameters that influence energy production.



Campbell Scientific Agrivoltaics in Action

The Fraunhofer-Institut für Solare Energiesysteme (ISE) agrivoltaic test area in Germany is a pioneering project investigating how solar panels affect crops. The site is divided into two sections, one with panels and one without, both growing different fruit trees. The project's goal is to assess the impact of the panels on yield, plant-focused tracking schemes, and water usage.

To this project, Campbell Scientific contributed an Agrivoltaic Monitoring System that plays a key role. The system's sensors:

- Track the sunlight reaching trees underneath the panels to optimise panel positioning for both electricity generation and ideal light conditions for the crops.
- Monitor soil moisture to assess how panels and shade affect water needs, providing data for more informed irrigation strategies.
- Compare environmental conditions between areas used for agrivoltaics and areas without panels.

This collaboration benefits Fraunhofer ISE and the agrivoltaic industry by providing:

- **Data-Driven Decision-Making:** Accurate, real-time light and soil moisture data empower researchers to optimise panel placement and irrigation strategies, ultimately maximising both crop health and solar energy generation.
- **Optimised Agrivoltaic Systems:** The collected data provide valuable insights that help Fraunhofer ISE achieve a delicate balance—maximising solar energy generation while ensuring optimal crop growth conditions. This assures compliance with local regulations and paves the way for developing efficient and sustainable agrivoltaic systems that benefit both researchers and the industry.

The Fraunhofer ISE project serves as a prime example of how Campbell Scientific's Agrivoltaic Monitoring System contributes to successful agrivoltaic research. This collaboration provides valuable insights for maximising the benefits of agrivoltaic systems, promoting both renewable energy production and sustainable agriculture.



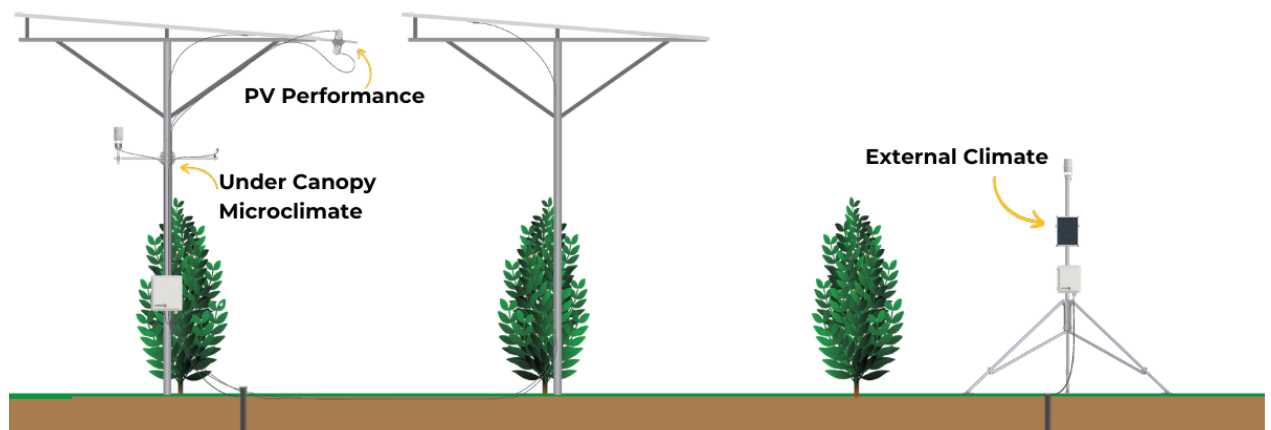


Enhanced Crop Production

Research, such as the project at Fraunhofer ISE, has shown that agrivoltaic systems can offer a range of benefits, including:

- Increased crop yields: Agrivoltaic systems provide partial shade, reducing heat stress in certain crops and leading to higher yields.
- Reduced water use: The shade solar panels provide can help reduce evaporation from the soil, which can then lead to lower crop water-use requirements.
- Improved fruit quality: In some situations, agrivoltaic systems can lead to improved fruit quality.

Example Commercial Agrivoltaic System Design



Addressing Your Specific Agrivoltaic Needs

Whether you're a researcher, developer, or farmer, Campbell Scientific has the customised tools and expertise you need to:

- Optimise crop growth and health.
- Maximise energy production.
- Ensure the sustainability of your agrivoltaic system.

Why Choose Campbell Scientific?

- **Unrivaled Data Quality and Reliability:** In agrivoltaic projects, failed monitoring systems and bad data can have expensive consequences. Campbell Scientific is the trusted leader in providing actionable data that are precise and consistent, season after season.
- **Complete Data Sets, No Gaps:** We recognise the critical nature of having a complete data set. Even the smallest data events can have a profound impact, which is why we ensure there are no data gaps.
- **Streamlined Monitoring for Cost Efficiency:** Campbell Scientific minimises hardware needs and aggregates data, streamlining your agrivoltaic monitoring requirements. This not only reduces costs but also simplifies the monitoring process for seamless efficiency.
- **Decades of Expertise:** For 40 years, we have monitored agricultural parameters. Moreover, we have been a leader for solar resource assessment and utility-scale PV performance monitoring solutions for more than 20 years.



Protecting Farms, Enhancing Yields

A Holistic Approach

At Campbell Scientific, we understand the intricate connections between climate, soil, PV performance, and plant physiology. Our monitoring solution offers a holistic approach, safeguarding your farm and maximising yield. From protecting against climate change impacts to ensuring the well-being of flora and fauna, we've got you covered.

Learn more about how Campbell Scientific solutions can help you achieve your goals. Contact one of our agrivoltaic experts to discuss your needs today!

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Measurements to Insights™



www.campbellsci.es/agrivoltaic-solutions

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