

Transforming Irrigation with Data-Driven Water Management for Sustainable Agriculture

KISTERS Australia



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Executive Summary:

Water scarcity, climate change, and evolving environmental regulations have underscored the importance of data-driven solutions in modern irrigation. KISTERS, a global leader with over 60 years in environmental data management, is transforming agricultural water management with its FieldRay Precision Irrigation Monitoring system. Designed for real-time data collection, integration, and optimisation, FieldRay enables agribusinesses to make informed water use decisions that enhance crop yield, comply with regulations, and increase land value.

FieldRay's real-time data capabilities track soil moisture, rainfall, and plant stress, providing a comprehensive view of irrigation needs. Through data visualisation and forecasting tools, FieldRay helps farmers optimise irrigation schedules, cut costs, and protect ecosystems. Its compliance features also ease regulatory burdens by ensuring water usage remains within permitted limits. By aligning with the European model of sustainable water management, FieldRay positions Australian agribusinesses to meet rising demands for sustainable practices and resource efficiency.

KISTERS also showcased its new HyQuant non-contact radar sensors at Irrigation Australia 2024, highlighting advanced monitoring solutions that integrate seamlessly into existing irrigation frameworks, offering precision, reliability, and affordability. Together, FieldRay and HyQuant represent KISTERS' commitment to empowering farmers with robust data tools to drive profitability, sustainability, and compliance in a challenging agricultural landscape.

Revolutionising Irrigation:

Leveraging Data for Water Management and Agricultural Success

As the challenges of water scarcity, climate change, and environmental regulations continue to intensify, the integration of data-driven solutions becomes indispensable for businesses in the irrigation industry. In today's fast-paced Agritech landscape, water management is not only a critical asset of ensuring yield but also plays a pivotal role in land valuation, environmental sustainability, and regulatory compliance. KISTERS, with over 60 years of experience in software, data management and environmental monitoring, is at the forefront of revolutionising how water is managed across the globe.

Data-Driven Optimisation: The Key to Sustainability

Water is the lifeblood of agriculture, and its management determines the long-term profitability of farming operations. In regions like East Anglia in the UK, over-licensed and over-abstracted catchments have strained water resources, leading to 20% of surface water bodies and 26% of groundwater bodies being damaged. As demand for water increases due to climate change and growing populations, agricultural businesses must embrace data-driven solutions to optimise water usage, ensuring sustainability while securing necessary permits for water abstraction.

In Australia, similar challenges are emerging. Farmers and agribusinesses face mounting pressure to balance water needs with environmental protections. A permit is not just a license to use water; it requires

proof that the water use does not harm ecosystems. This is where data becomes indispensable—businesses need accurate, real-time monitoring systems to demonstrate sustainable practices to regulatory bodies.

The Role of Data in Securing UK Permits and Increasing Land Value

Securing a water permit is critical, not only for immediate agricultural needs but also for the long-term value of the land, to secure jobs, implement measures for efficiency to improve marketable yields and remain competitive in a global market. With water becoming an increasingly valuable commodity, land with reliable water access commands a premium in the market. This is where Kisters FieldRay Precision Irrigation Monitoring system offers immense value. By providing real-time data on water use, soil moisture, rainfall, and plant stress, FieldRay empowers farmers to make informed decisions, ensuring that they optimise their water use without exceeding their permitted volumes.

Moreover, by leveraging data to forecast water demand, agricultural operations can plan and invest strategically. This includes high-flow storage solutions, pumping surface water into offline storage, and integrating energy-efficient management to reduce costs. The ability to adapt to changing environmental conditions ensures compliance with both environmental regulations and the growing expectations of environmentally conscious consumers.

Lessons from Europe: A Blueprint for Australia's Future

European agriculture, particularly in water-stressed regions like the UK, offers valuable insights for Australia's irrigation future. European farmers have embraced data-driven tools to both proactively and reactively manage water resources. In these regions, water abstraction permits are no longer indefinite but time-limited, requiring businesses to consistently prove they are using water sustainably. These regulatory shifts have pushed farmers to adopt high-tech monitoring solutions, like those offered by KISTERS, to stay compliant and maintain productivity.

Australian agribusinesses can learn from these European experiences. The adoption of comprehensive water monitoring strategies—tracking groundwater and surface water flows, soil moisture, and energy costs—can ensure that water is used efficiently, improving profitability while protecting the environment.

Enhancing Profitability Through Integrated Data Systems

Modern agricultural businesses cannot afford to operate with siloed systems. Integration is key to success. KISTERS approach focuses on bringing together different data streams—monitoring irrigation networks, plant health, energy use, and climate conditions—into one comprehensive platform. This enables farmers to not only make faster, more informed decisions but also align their practices with long-term business plans and sustainability goals.

The result is clear: by optimising water usage through data, agribusinesses can enhance yield, reduce costs, and protect the environment, all while increasing the value of their land.

Conclusion: A Data-Driven Future for Irrigation

In the face of climate change, increasing water demand, and stricter environmental regulations, the future of agriculture depends on the ability to collect, analyse, and act on data. KISTERS FieldRay system offers the tools that agribusinesses need to thrive in this changing landscape. By leveraging real-time data for water management, irrigation businesses can ensure they stay compliant, optimise water use, and secure the long-term profitability of their operations.

As Australia looks toward a more sustainable future, the lessons from Europe and the power of data-driven solutions will be crucial in shaping the irrigation industry for generations to come.

FieldRay is an advanced irrigation monitoring system developed by KISTERS to help farmers and agricultural businesses optimise water usage while ensuring environmental sustainability and regulatory compliance. Here's how it works:

1. Real-Time Data Collection

FieldRay collects real-time data from multiple sources, including:

- **Soil moisture sensors** to monitor the water needs of crops.
- **Rainfall data** to track natural water inputs.
- **Surface and groundwater flow sensors** to assess water availability.
- **Pumphouse and network management systems** that track faults, pressure, and energy usage.

By gathering this comprehensive data, FieldRay gives users a clear picture of how much water is being used, where it's being applied, and how much more is needed to ensure optimal crop growth.

2. Data Integration and Visualisation

All the data collected by FieldRay is integrated into a single platform, allowing farmers to visualise it in an intuitive, easy-to-understand format. This includes:

- **Water usage trends** over time.
- **Soil and crop stress levels**, highlighting areas where irrigation is needed most.
- **Energy consumption and network performance** to identify inefficiencies in water delivery systems.

By having all the information in one place, farmers can make informed decisions quickly, reducing the guesswork and improving overall irrigation efficiency.

3. Optimisation and Forecasting

FieldRay helps optimise irrigation by using the collected data to:

- **Tailor irrigation schedules** based on actual soil moisture and weather conditions.
- **Forecast water needs** by taking into account expected rainfall, crop growth stages, and environmental factors.

- **Plan investments in infrastructure**, such as high-flow storage systems, based on long-term water usage patterns.

This data-driven approach ensures that water is used efficiently, reducing waste and costs while protecting the environment.

4. Regulatory Compliance and Reporting

In many regions, including Australia and Europe, water use is tightly regulated, and farmers need to prove that their water abstraction is sustainable. FieldRay simplifies compliance by:

- **Tracking water usage against permits** to ensure farmers do not exceed their allowed volumes.
- **Providing detailed reports** that can be shared with regulatory authorities to prove compliance.
- **Supporting environmental protection initiatives** by monitoring the impact of irrigation on local water sources.

This feature helps farmers maintain their water permits, which are crucial for long-term farm operations and land value.

5. Climate Adaptation

With climate change increasing water scarcity and altering weather patterns, FieldRay is designed to adapt. It updates its **evapotranspiration (ET) models** based on current climate data, ensuring that irrigation schedules remain effective even as conditions change.

In summary, FieldRay works by integrating real-time data from various sources, providing visualisation tools for better decision-making, optimising water use through forecasting, and ensuring compliance with environmental regulations. This all-in-one system empowers farmers to improve water management, save on costs, and protect their long-term investment in both land and crops.

The KISTERS team recently exhibited at Irrigation Australia 2024, and Matthew Ellison (HydroMet and AgriMet Solutions Architect) was a keynote speaker. We cover all your HydroMet needs but at this event showcased our new HyQuant non-contact radar sensors. KISTERS HyQuant offers:

- More insight without changing or adding sensors
- Seamless integration and configuration
- Ultimate precision and reliability
- Affordable without compromise
- Simple installation
- Its built to last
- Accurate, adaptable and contactless

Find out more on how we can support your irrigation needs by contacting us today:

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