



**Practice Abstract 20 -
Farm Management Information System (FMIS) in Carrot
Production (SIP6)**

20. Farm Management Information System (FMIS) in Carrot Production (SIP6)

Short Summary for Practitioners in English

Problem:

Carrot producers are increasingly facing challenges related to rising production costs, water scarcity, climate variability, and growing demands for sustainable and traceable agricultural practices. Many small and medium-sized farms lack simple and affordable tools to monitor crop conditions, optimize irrigation and fertilization, and document farming operations required for regulatory compliance and certification schemes.

Solution:

Within the FARMTOPIA project, Agricolus and SATA developed and validated a digital solution specifically tailored to carrot production based on the Agricolus Farm Management Information System. Agricolus is a digital platform that integrates field mapping, satellite imagery, weather data, IoT sensors, and predictive models to support farmers in daily operations and strategic planning. To keep the solution affordable for small and medium-sized farms, it relies on virtual weather stations (avoiding the investment required for physical stations) and follows a freemium pricing model. The system guides users throughout the entire production cycle, from farm digitalization and crop registration to real-time monitoring of crop and environmental conditions, recording of field operations, and evaluation of agronomic, economic, and environmental performance. The platform supports crop health monitoring, irrigation management, disease risk assessment, fertilization planning, traceability, cost analysis, and sustainability reporting. Through intuitive dashboards and reporting tools, Agricolus enables farmers to make informed decisions based on data rather than assumptions. Within SIP6, crop-specific models for carrot phenology, irrigation, and fertilization were co-developed by Agricolus and SATA. The phenology and irrigation models have achieved a high level of reliability and have been successfully validated under real farming conditions. The fertilization model is currently being further refined through the collection and analysis of additional field data and finalized, validated and released under real farming conditions.

BENEFITS:

The adoption of the platform resulted in a >22% reduction in fertilizer use and a >29% reduction in irrigation volumes compared to the farms' usual practice (and considerably more against national reference values of conventional practices), while maintaining and slightly increasing crop yield and product quality. Participating farmers successfully adopted and used all 12 digital tools available within the platform, including satellite monitoring, task management, irrigation and fertilization decision-support systems, and weather forecasting services. The solution has reached TRL 8, demonstrating its effectiveness in operational farming environments. Farmer surveys revealed a high level of satisfaction, acceptance, and trust in the technology. Additional benefits include:

- Reduced costs associated with water and fertilizer use.
- Improved planning and management of farming operations.
- Continuous crop monitoring through satellite-based observations.
- Enhanced traceability and farm data management.
- Improved environmental sustainability.
- Better preparedness for future certification schemes and market requirements.
- Increased resilience to climate variability and extreme weather events.

Practical Recommendations:

To maximize the benefits of digital farming, farmers should regularly record field operations and consistently use monitoring and decision-support tools. The performance and accuracy of predictive models improve over time as additional farm-specific data become available. Farmers can start with the platform's basic functionalities and progressively adopt more advanced services according to their needs. Thanks to the use of satellite data and virtual weather stations, the solution is particularly suitable for small and medium-sized farms that want to implement precision agriculture practices without investing heavily in hardware infrastructure. The carrot-specific phenology, irrigation and fertilization models support day-to-day management decisions, helping farmers optimize resource use and improve operational efficiency; continued data collection and advisory support further increase the value of the system over time.

Further information

- SATA: <https://www.satasrl.it/>

About this practice abstract and Farmtopia

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Farmtopia: The project is running from September 2023 to August 2026. The overall goal of Farmtopia (**GA No.: 101083541**) is to democratize digital farming to empower small and medium farms.

Website: <https://farmtopia.eu/>

Agricolus srl: In the project, it leads preparation and implementation of the Italian Sustainable Innovation Pilot 6, focusing on the carrots sector. Thanks to the other partner involved (SATA), it is possible to engage three carrots farms around Italy.

Website: <https://www.agricolus.com>

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