NEWS

The Arrogant Harvest

Modern food production is driven by data, from a single grain to an entire field.

31 July 2026, Tobias Engl

A field robot moves at walking pace through a field of onions and records, with an accuracy of eight millimeters, exactly where it has placed each seed. Using this data, it later identifies areas where only weeds can be growing and mechanically removes them before the crop even breaks through the soil. The FarmDroid FD20 sows and weeds on its own, powered by solar energy, covering up to six and a half hectares a day, and alerts the operator as soon as anything deviates from the plan. What is happening here is more than just automation. The field has become “readable.”

This is where the real turning point in modern food production lies. It is not a single machine, but the fact that every square meter emits signals: soil moisture, leaf color, the position of a seedling, and the flow of gas above the soil. Those who capture these signals replace estimation with measurement.

A layer of data which has long been part of everyday life spans the gap between robots and research operations. Satellites in the Copernicus fleet provide weekly inventory maps, drones survey crop damage, and networked sensors report moisture and climate conditions every minute. These individual data points are transformed into a stream of data that can be analyzed.

The same logic applies indoors. In greenhouses and indoor facilities, lettuce, herbs, and mushrooms grow under controlled climatic conditions; each batch is monitored for light, temperature, nutrient solution, and CO_2 levels. What the weather dictates outdoors becomes a control variable indoors, and production is no longer tied to the seasons.

Across large areas, John Deere demonstrates the results of this technology. Cameras mounted on the spray boom scan tens of square meters per second; image recognition distinguishes crops from weeds, and individual nozzles activate only where weeds are actually present. During the 2025 growing season, this technology was deployed across approximately two million hectares and nearly halved the amount of herbicide applied a reduction of about one hundred seventeen million liters of pesticides. As a side benefit, it generates a map of weed pressure that serves as a starting point for the next growing season.

The DaVaSus research project at the Gut & Bösel farm demonstrates just how far data collection can go. Soil sensors, a gas spectrometer for greenhouse gas fluxes, real-time PCR for soil life, photonic sensors that detect flying insects by their wing beats, plus weather stations and satellite images. Artificial intelligence translates the raw data into indicators, and an evaluation process ultimately converts humus accumulation, nitrous oxide, and biodiversity into a monetary value. For the first time, the farm can see the ecological and economic value of its farming practices.

The benefits build on one another. Precision saves resources: seeds, water, nutrients, and pesticides go exactly where they’re needed and nowhere else. Predictive capabilities are added because infection windows can be identified based on temperature and leaf wetness before any damage becomes visible. Each pass leaves behind a map, so the next decision is based on data rather than memory. Lightweight, autonomous machines protect the soil and operate around the clock, regardless of staffing constraints. And because ecological performance can be quantified, production becomes verifiable - to customers, regulatory agencies, and the farm itself.

A signal is only as valuable as its visibility. A sensor that no one reads doesn’t change anything, and a map that stays in the silo doesn’t guide anyone. The work that matters most right now is integrating a company’s many systems into a single picture and providing the right data to support the right decision. That’s exactly where ScreenWay comes in connecting systems, making data visible, and turning measured values into decisions.