smart skills

smart sustainable agriculture

www.smartskillsproject.eu

Good Practice Guide

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them. 2023-2-PL01-KA220-VET-000178755

contents

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them. 2023-2-PL01-KA220-VET-000178755

01

Introduction

INTRODUCTION TO SMART SKILLS

The objective of Smart Skills is to improve digital literacy and promote the exchange of creative methods in the EU agro-sector. The project is in line with the urgent objectives of addressing climate change, achieving the Sustainable Development Goals, and advancing rural sustainability. As part of our European partnership, we will:

- Address cultural and occupational barriers to digital adoption in agriculture
- Assess and promote good practices in the agro-sector's digital technologies, and
- Openly publish our findings around Europe to improve awareness and impact.

The Smart Skills project aims to increase the competitiveness and sustainability of small and family farms in rural areas by addressing the low adoption of innovative technologies and modern practices**. Drawing on successful practices from all partner countries, the project offers valuable insights into how technology transfer can contribute to sustainable rural development in different economic landscapes**.

The project's impact positively affects rural areas in all partner regions and across different agricultural landscapes in the EU. Agriculture is a key sector in the EU, employing a significant portion of the population, especially in rural areas. Smart Skills can lead to more efficient and sustainable practices through new SMART techniques and technologies, making farms more competitive and environmentally friendly. All partner countries can gain new perspectives on integrating digital technologies on smaller farms. They can benefit from modern farming practices that address the unique challenges posed by its diverse geography, such as smart water management.

A deeper needs analysis of the project partners highlighted major challenges among partner countries, including knowledge gaps in digital skills or smart and sustainability and climate action for educators, rural farmers, and agro-SMEs. Labour shortages caused by youth leaving rural areas and a lack of relevant digital skills are also challenges. The Consortium must act now to equip and empower teachers, farmers, and rural developers to become change-makers for a smarter and more sustainable Europe.

How will Smart Skills respond to those needs?

1. SMART Kit of Digital Skills and Knowledge: This toolkit offers practical applications and simulations, complemented by Open Educational Resources (OERs), to help farmers implement smart farming technologies effectively.
2. SMART SKILLS Digital Learning Platform: Designed for micro-learning, this platform offers flexible training modules that fit into the busy lives of farmers, ensuring effective learning and implementation.
3. SMART SKILLS 'Train the Trainer' Programme: This programme aims to equip national rural developers with the skills to train others, creating a ripple effect that ensures widespread knowledge dissemination.

About this Guide

Be inspired by **30 Good Practices** from Poland, Ireland, Italy, Slovakia, Czech Republic, and other EU countries.

The Smart Skills Good Practice Guide is an important and inspirational part of the first research phase of the Smart Skills Erasmus+ project. By doing proper research in each partner country, the pan-European consortium created this guide to equip educators with **awareness of how cutting-edge technologies can optimise and sustain agricultural practices**.

30 innovative practices have been collected as a motivation for VET educators to integrate change and smart skills resources into their courses in a way that complements and enriches existing programmes & skills development.

These examples of implementing sustainable agriculture can be used as **an inspiration for many farmers and educators** to develop solutions for sustainability problems locally, regionally, nationally and internationally.

Every farmer and educator, who wishes to be inspired by other farmers across the EU, has access to this **Good Practice Guide** and other results of the Smart Skills project via the project website: https://smartskillsproject.eu/

Smart Sustainable Agriculture

Dive into innovation and cutting-edge technology with the Smart Skills Good Practice Guide!

Smart Sustainable Agriculture – In other words, **optimising farming practices while ensuring environmental sustainability**. As the Smart Skills team is discovering during the Erasmus+ project's duration, this term is no longer a topic of the future.

In this guide, you will see how advanced agriculture is already today by using various cutting-edge technologies such as:

- **Internet-of-Things**
- **Big-data analytics**
- **Artificial Intelligence**
- **Machine Learning**
- **Robotics and Automation**
- **Drones and UAV's**
- **Smart sensors**
- …and many more.

Thanks to these technologies, farmers can implement precision farming by applying the exact amount of fertilisers, pesticides and water according to actual needs and be able to monitor crop health, soil, weather conditions, and resource use in real-time.

The further elaborated good practices in this guide explain how these technologies reduce waste and minimise environmental impact while improving the efficiency and productivity of the farm.

Fundamental to smart and sustainable agriculture is the concept of data-driven decision-making. By collecting and analysing large data sets, farmers can make informed decisions that balance profitability with sustainability. For example, predictive models based on artificial intelligence can forecast crop yields, pest outbreaks, or potential water shortages, enabling proactive measures to be taken. In addition, the use of renewable energy sources, vertical farming and regenerative agricultural practices align with Sustainable Development Goals by reducing the carbon footprint and increasing biodiversity.

The aim of smart agriculture should be to improve the agricultural industry and focus on making the whole agricultural and food production cycle more efficient, practical, and of the highest quality while taking into account the needs and challenges of farmers.

By introducing smart sustainable agriculture in their everyday work, farmers can counteract climate change with all its challenges. An important aspect of climate-smart technologies is intelligent water management. For crops or land that receives little rainfall, an efficient irrigation system is essential. It must deliver the right amount of water without wasting it, and it is crucial to maximise the water requirements for different locations.

This and many more inspiring topics are waiting for you in this Guide of Good Practices.

Fields of Smart Sustainable Agriculture

Using mobile phones, devices and other equipment, smart agriculture aims to fix a field or piece of land by creating limits that include soil moisture content, compost or material substance, environment, climate and the creation of the required yield. As a result, the data that can be obtained from small farmers is digitised.

Numerous specialised companies, including input suppliers, agro-processors and monetary or financial providers, can use the data to create farmer profiles that can be improved over time. Through the effective use of data and service providers, farmers can reduce expenses, improve profits and create healthy farms.

Let's explore the various fields of smart sustainable agriculture:

Digital Agriculture

Like many other industries in the modern era, agriculture has embraced digitalisation. The growing need to change agriculture to a more sustainable and ecologically friendly practice is closely related to the introduction of digital technologies and solutions. Digitalisation increases sustainability, productivity, and efficiency while decreasing food waste through a controlled approach.

Precision Farming

Digital technologies like precision management systems and data monitoring through the Internet-of-Things greatly enhance decision-making by giving farmers access to real-time information on weather and animal health. This aids in addressing climate change and making plans for future generations.

Fields of Smart Sustainable Agriculture

Sustainable Agriculture

The Common Agricultural Policies (CAP), which regulate the application of sustainable solutions in agriculture, primarily concentrate on three areas:

- economic sustainability,
- environmental sustainability
- social sustainability of farms

To accomplish these three primary goals, which are tailored to each nation's particular needs and include CAP strategic plans, EU nations employ a range of focused initiatives. By employing these programmes, EU nations are assisting farmers in meeting the goals of the EU Green Deal, preserving their income, and converting to sustainable production. In addition to the CAP being implemented nationally by all EU nations, the Sustainable Development Goals (SDGs) are being introduced by the UN as a call to action to combat climate change and work to protect our land, oceans, and forests.

Agriculture 4.0

Among the challenges that farming and agriculture have had to face and solve creatively are climate change, food waste, resource scarcity, and the fast-growing population. A fundamental change in approach was required due to the inefficiency of earlier approaches. Since the initial agricultural technology revolution in 1961, modern farming practices have undergone significant change. It gets more and more creative and widespread. Therefore, the next agricultural revolution, known as Agriculture 4.0, needs to be as technologically and environmentally advanced as possible.

INNOVATION MEANS REPLACING THE BEST PRACTICES OF TODAY WITH THOSE OF TOMORROW.

– Paul Sloane

02

The Case Study Methodology

Collection of Good Practices

This set of 30 Good Practices has been collected by partners and includes 25 partner-nation practices of smart sustainable agriculture and 5 additional EU-wide examples. The case studies demonstrate the opportunities that lie within climate-smart agro-technologies, and showcase their positive impact on the environment.
Providing insight into those technologies and inspiration for farmers, this compendium is a unique resource to be used in VET training or for individual education purposes in a self-paced learning manner.

We particularly encourage vocational training educators to use our set of good practices of the Smart Skills project for several reasons:

Good practices ...

- are an example of putting theory into practice
- are a tool to better explain the concept of sustainable agriculture
- motivate farmers to implement the presented technologies in their daily work

One of the main benefits of using good practices in VET is that students actively work to identify principles, by drawing conclusions from the examples.

This improves their ability to solve problems, think critically, make decisions in challenging circumstances, and deal with ambiguity.

THE GOOD PRACTICE METHOD

The results of the Smart Skills Good Practice Guide are directed to three target groups:

1. Small Rural Farmers / Agro-SMEs
2. VET educators and auxiliary teaching staff
3. Rural development agents, agricultural engineers, or consultants

How can a collection of good practices be beneficial for those target groups?

The Smart Skills Good Practice Guide provides not just a single study of smart sustainable agriculture. It is a solid body of 30 evidence-based practical examples of smart technologies being used in agriculture. It serves as an inspiration to implement one's own innovative ideas or to take an example of those who have gone through similar challenges and their solutions.

At Smart Skills, we do not use the term 'best practice' to describe our case studies, as the aim is to motivate farmers and educators to strive to come up with even better solutions. We want them not to stop at the examples given by the Smart Skills consortium, thinking that these practices are the best, but to be motivated to strive to further develop their farming skills and practices and thus become changemakers of the future of European agriculture.

According to Velenchik (1995), the case method encourages students to learn theory. Examples are often used in VET training to demonstrate how theoretical concepts are applied. However, because we have already taught the theory, we often use an example to reinforce the theory, rather than treating the theory as a set of tools to solve an application question. Therefore, theory itself is the main focus, and application is often seen as incidental. Learning becomes more difficult than it should be when students do not understand the purpose of theory and often do not understand the necessary tools.

The problem that students, farmers, or other stakeholders are trying to solve takes centre stage in the case method. They start looking for tools after they quickly realise they lack them. Theory is what they want to learn. In addition, students can be effectively moved up the ladder of cognitive skills from lower levels of knowledge, understanding, and application to higher levels of analysis, synthesis, and evaluation through the case method. Bloom (1956) first proposed this educational taxonomy, which offers a clear and structured method for developing students' skills.

Both educators and students can benefit greatly from a compendium of good practices for smart and sustainable agriculture in vocational education and training (VET). It brings together effective, scientifically supported techniques, technologies and methods that support sustainable agriculture, increasing productivity while reducing environmental impact. A carefully selected compilation of real-world examples of resource efficiency methods, agroecology and precision agriculture helps VET programmes to remain current, relevant, and in line with industry standards. It helps students bridge the gap between theory and application, supporting the development of practical skills and competencies. Such a resource also encourages the adoption of creative solutions that support biodiversity conservation, soil health and climate resilience, enabling aspiring agricultural professionals to affect positive change in their communities and the industry as a whole.

THE GOOD PRACTICE METHOD

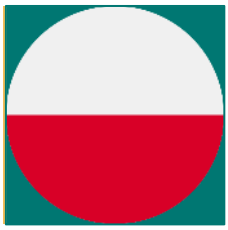
How did we choose our case studies?

All good practices were carefully analysed and selected by partners from Poland, Ireland, the Czech Republic, Slovakia, and Italy based on the following criteria:

- **Environmentally, economically and socially sustainable:** A "good practice" takes care of present requirements without compromising the capacity to take care of future demands.
- **Effective and successful:** A "good practice" has been successfully implemented and has benefited both individuals and communities, demonstrating its strategic importance as the most efficient means of accomplishing a particular goal.
- **Inherently participatory:** Because they promote a shared sense of responsibility for decisions and actions, participatory techniques are crucial.
- **Technically feasible:** A "good practice" is based on technical viability. It is simple to understand and use.
- **Reducing disaster/crisis risks, if applicable:** A “good practice" helps to reduce the risk of disasters and crises for resilience.
- **Replicable and adaptable:** A "good practice" should be replicable, meaning it should be flexible enough to accommodate similar goals in different contexts.
- **Gender-sensitive:** A practice description must demonstrate how participants, both male and female, were able to enhance their standard of living.

03

Pan-European Case Studies



POLAND

Hodowla Roślin Smolice

Type of technology used:

- ✓ Precision farming technology application using the StarFire 6000 receiver
- ✓ Internet-of-Things

Does the Practice relate to hardware, software or both?

- ✓ Software

Smolice Breeding Company is a Polish breeding and seed company. Its main activity is breeding modern varieties of agricultural plants - mainly corn, cereals, legumes and rapeseed.

The company is the owner of over 120 varieties of crops and has won many prestigious awards. The company also produces the highest quality seeds of its varieties, which are sent to the best seed companies for further reproduction and to distribution networks throughout the country and abroad. The seeds of the company's breeding varieties are valued and eagerly sown by farmers also outside Poland, including in the Czech Republic, Slovakia, Austria, Germany and France, Belarus, Lithuania and Finland. Currently, the company has 5,771 ha and employs 265 people. Due to the large area of cultivation, the company has been investing in modern, precise equipment for years

How is this technology being used?

The main pillar of the presented company is the production of corn seeds for sowing. Managing corn seed plantations differs from typical plantations.

The difference lies, among other things, in the sowing of seeds. First, the mother forms of corn are sown and after some time, several father forms at several dates. Typical corn cultivation involves sowing in a 75 cm spacing between rows. In the case of father forms, this distance can be significantly reduced. The savings in this case consist in reducing the area occupied by father forms, thanks to which the maximum part of the field is used for sowing mother forms.

In 2016, the company invested in a specialized StarFire 6000 receiver, which uses much more modern components (electronics, signal processing systems, a new antenna) and allows for optional expansion with functions such as a new locking mechanism, which is to more effectively protect the machine against theft.

The device receives not one, but three StarFire correction signals from geostationary satellites in parallel. In the event of loss of signal from one of them, it can switch to the other of the two remaining SF3 correction signals. This facilitates work and accuracy in difficult conditions, e.g. when working on headlands near forests. The use of this technology ensures 3 cm accuracy between passes, no overlaps and operator comfort.

Hodowla Roślin Smolice

The Technology's Sustainable Impact

The concept of sustainable agriculture includes the use of appropriate practices in plant cultivation and animal husbandry aimed at the effective production of safe, high-quality food in a way that protects the natural environment.

Sustainable production technologies must prove economically viable to ensure that agricultural producers use them in practice for a long time. Sustainable production is a response to the challenges posed to farmers by the European Green Deal, which requires a significant reduction in the use of mineral fertilisers, pesticides and antibiotics. However, precise application of fertilisers or plant protection products is not only beneficial for the environment, but also for the farmer's wallet in the form of measurable savings in the use of very expensive means of production.

Thanks to satellite techniques, modern sprayers, fertilizer spreaders and seeders have an automatic section control function (Section Control), which, without the operator's involvement, turns off the machine's sections when they enter already made areas of the field or beyond the field boundary.

How this is Inspirational for others

The use of the StarFire 6000 receiver is a unique way to improve crop yields and increase the precision and accuracy of agricultural production - both on a small and large scale.

The technology has the potential to transform agricultural operations in terms of long-term cost savings and of course, by reducing the environmental impact of operations.

The connection to IoT systems that the StarFire 6000 receiver uses is particularly inspiring, as it allows the farmer to have full control over the state of the field and crop. By receiving real-time information, decisions will be precise, and actions will be data-driven.

The StarFire 6000 receiver serves as an example of how cutting-edge technologies such as GPS, machine learning and real-time data can be used in agriculture to address the challenges of climate change. Because of its success, farmers are now exploring additional precision farming, robotics and automation technologies that can increase farm productivity and sustainability.

USEFUL LINKS

- YouTube
- YouTube
- YouTube
- Facebook

TopFarms Group

Type of technology used:

- ✓ Climate Fieldview for comprehensive monitoring
- ✓ Internet-of-Things

Does the Practice relate to hardware, software or both?

- ✓ Software

The Top Farms Group operates on an area of over 30 thousand hectares in the following provinces: Wielkopolskie, Lubuskie, Warmińsko-Mazurskie and Opolskie.

They have been on the Polish market for over 25 years. Currently, it is one of the largest and best-managed agricultural enterprises in Poland. As a top producer in the agri-food sector, they set trends, especially in the areas of innovation, crop optimisation and regenerative agriculture. They also cooperate with agricultural universities, enabling internships for young people who want to associate their future with agricultural activity in our country

How is this technology being used?

The application allows plots be marked, belonging to the farm on uploaded maps, and based on satellite images, it determines the location of a given area and shows soil variability on the plot and creates sowing standards.

The Top Farms Group uses the device and the app for sowing, spraying and harvesting. During the vegetation, the health of the crops is monitored, which allows to detect diseases and stress factors and introduce immediate action. The application gives you the opportunity to view the operation of the equipment, e.g. combine harvesters, on an ongoing basis. The measurement error in the conditions of use for the TopFarms user is about 0.2%. The application reads data on the yield from a given crop on a given plot, creating a legend thanks to which it is possible to observe how the crop yields in individual places on the plot.
From each field, reports can be generated containing the number of mowed hectares, yield, moisture, dry matter, average yield.

Analysis of the yield from the field allows you to decide on the choice of the variety that works best in the conditions of the farm and to decide on the change of fertilization doses. The application is used for planning based on data collected from previous seasons.

TopFarms Group

The Technology's Sustainable Impact

The use of Climate Fieldview improves the profitability of the farm by increasing the yield, and a reduction of production costs, which comes about by optimal use of plant protection products.

The use of a variable dose of fertilizers according to demand will also have a positive impact on the environment. The application supports precision farming, the purpose of which is to maximize yields, increase agricultural production efficiency, improve product quality, reduce unnecessary interference with the environment and reduce production costs.

The Fildview mounted on agricultural vehicles is compatible with many brands, which allows you to have different brands of equipment on your farm without the need to customize your entire fleet of machines.

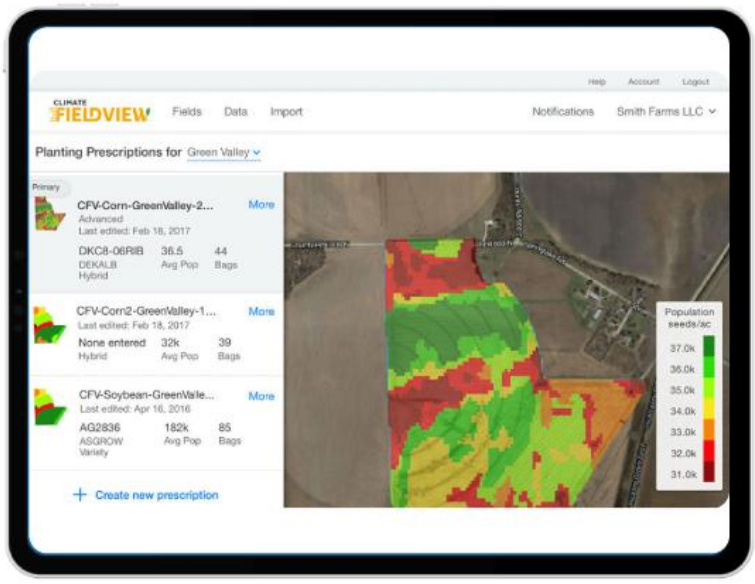
How this is Inspirational for others

The Climate Fieldview practice by TopFarms Group exemplifies how technology can drive sustainability in agriculture through precision monitoring. By optimising resource use and enhancing crop health tracking, it inspires farms to increase yield efficiency while minimizing environmental impact.

The presented method of crop monitoring can be an inspiration mainly for medium and large farms, which are equipped with a more modern machine park compatible with the device. The possibility of savings in the form of reducing the amount of fertilizers, plant protection products and seeds used will certainly be an incentive. The price for subscribing to the application is not excessive, which should additionally contribute to increasing the range of its use.

USEFUL LINKS

- Climate Field View
- Top Farms Group
- YouTube
- YouTube



IHAR Experimental Plant

Type of technology used:

- ✓ Drones and UAV's to monitor the condition of sowing

Does the Practice relate to hardware, software or both?

- ✓ Hardware

The Grodkowice Experimental Plant is one of the six departments of the Plant Breeding and Acclimatisation Institute. The area of arable land is 420 ha.

The Department deals with the cultivation of many plant species and conducts field experiments aimed at checking the yield potential of rapeseed, wheat and maize varieties and their resistance to diseases. The plant also conducts experiments on fertilisers and the effectiveness of plant protection products. A characteristic feature is the high fragmentation of the fields, which makes fieldwork and observation difficult

How is this technology being used?

One of the reasons for using drones on a farm is to locate crops near forests inhabited by wild animals, who are increasingly looking for food on farmland.

Another problem for farmers is the so-called hunting damage, which occurs as a result of scaring the game away during hunting. Aerial inspection of the soil detects the presence of game on the field and prevents damage.

The farm also uses unmanned aerial vehicles equipped with multispectral cameras, which allows for quick and precise control of the condition of plants even on an area of hundreds of hectares. It allows one to assess the health of plants before the first signs of disease appear on the leaves or stems. By using cameras that record both visible and invisible light bands, the drone creates a precise health map of plants, showing where it is necessary to implement measures to prevent the spread of diseases. Aerial control of the crop area also allows you to monitor the state of plant irrigation.

IHAR Experimental Plant

The Technology's Sustainable Impact

The use of drones in Grodkowice's Experimental Plant enhances sustainability by allowing precise, data-driven crop management. It minimises the need for chemical treatments by early disease detection and targeted intervention, reducing environmental impact.

Thanks to the use of unmanned aerial vehicles, it is possible to instantly track disease outbreaks, and thus reduce the use of crop chemical protection products to a minimum. Locating places where plants develop more slowly allows for precise fertilization, and planning a detailed crop development strategy based on detailed data such as chlorophyll content or plant growth phase. All these activities contribute to maximising yield while reducing the negative impact on the environment.

How this is Inspirational for others

The IHAR Experimental Plant showcases how drones enable affordable, precise crop monitoring, reducing chemical use and optimising resources. It's a scalable model for farms aiming to enhance productivity sustainably.

Along with this, the variety and specifications of drones used in agriculture is enormous. This allows experiment allows one to choose equipment tailored to the needs and budget of the farm. There are also companies on the market providing services in the field of permanent or ad hoc monitoring of fields, so the farmer does not have to buy the equipment themself. The use of drones reduces the amount of time needed to inspect the field and gives an image of the entire field without the need to enter its surface, which also reduces the costs of fuel consumption or equipment wear, among other things.

USEFUL LINKS

- YouTube
- YouTube

Grzegorz Bardowski's farm

Type of technology used:

- ✓ ISARIA SMART CROP SENSOR

Does the Practice relate to hardware, software or both?

- ✓ Hardware
- ✓ Software

This farm, managed by a young, innovative farmer, Grzegorz Bardowski spans 130 hectares, where wheat, rapeseed, corn, sugar beet, and malting barley are cultivated.

Through partnerships with various companies, the farm regularly tests new technologies and the most useful ones for the area and crop species are introduced. The owner of the farm takes part in numerous trainings and conferences, improving his knowledge in the field of agriculture, and is all the while looking for new environmentally friendly solutions.

How is this technology being used?

The ISARIA sensor optimises chemical input by measuring crop biomass and nutrient needs, ensuring efficient input use tailored to plant absorption, reducing waste and enhancing yield quality

The CROP SENSOR is a tool that the farmer uses for the optimal application of nitrogen fertilisers, growth regulators or crop protection products in various plant cultures. An optimal nitrogen supply affects the size and quality of the crop. Only as much as the plants can absorb is used, which is very conservation of resources. The sensors measure the biomass, which reflects the density of the crop and the N-index to assess the state of nutrient demand. On the farm, in addition to the use of fertilisers for sowing fertilizers, CROP SENSOR is used for the application of fungicides.

Grzegorz Bardowski's farm

The Technology's Sustainable Impact

The ISARIA sensor promotes sustainability by precisely adjusting nitrogen fertiliser use based on crop needs, reducing excess application, conserving resources, enhancing nutrient efficiency, and supporting healthier crop yields with minimal environmental impact.

The technology used affects the optimal dosage, fertiliser savings, equalisation of the nitrogen balance and its enhanced utilisation, which impacts the yield potential, yield growth and increased grain quality. Proper application of nitrogen fertilisation adapted to plant requirements prevents increased vegetative development – unproductive tillering of plants. Plants fertilised with nitrogen are characterised by an increased amount of water in the tissues, and thus more vulnerable to mechanical damage, which means they can become dislodged during rainfall and strong winds. The consequence is increased susceptibility to attack by pests and pathogens, difficult harvesting and loss of crop.

How this is Inspirational for others

This case study highlights how precision tools like the ISARIA sensor can simplify fertilisation decisions, reduce costs, and improve crop health, inspiring farms to adopt resource-efficient practices.

The use of this type of system is addressed primarily to farmers with large farms where large amounts of fertilisers and plant protection products are used. Optimisation of the use of fertilisers and plant protection products will have a positive impact on plant health and economic result. The use of sensors will relieve the farmer of the need to determine the fertilisation dose, which is important in the case of the number of decisions made every day.

USEFUL LINKS

- YouTube
- ISARIA

Top Agrar Polska

Type of technology used:

- ✓ StopCHwastom app
- ✓ Internet-of-Things

Does the Practice relate to hardware, software or both?

- ✓ Software

This polish farm, managed by Tomacz Czubiński, a young, part-time farmer, spans 15 ha. and focuses on rapeseed, wheat & soy, integrating budget-conscious technology to optimise sustainable crop management

As an additional source of income to working full-time this farmer leases 11 of his 15ha. From others who have stopped farming. The only activity is the cultivation of plants - mainly rapeseed, wheat and soy. Due to the small area, the machine park is limited to necessary equipment and the replacement of machines is based mainly on the purchase of used equipment. The basis of farm management is a precise assessment of inputs and the search for technological solutions that facilitate the management of the farm in accordance with the budget.

How is this technology being used?

This farm uses the StopCHwastom app to identify weeds and select the appropriate chemical to control them.

The application contains a database of over 100 weed species, and over 1200 photos of weeds in various development stages, allowing for their recognition based on visual features thanks to a simple graphic key.
The most important element of the application is the selection of an effective active substance and herbicides containing it (a common agent for one or even five weeds). In addition, the percentage of control effectiveness is provided for each substance and weed species. The application also allows for telephone or e-mail contact with the nearest (according to GPS location) point of sale of plant protection products or selected from a database of about 3000 companies.

Top Agrar Polska

The Technology's Sustainable Impact

The StopCHwastom app enhances sustainability by enabling precise weed identification and the selection of effective herbicides, thereby reducing unnecessary chemical applications. This targeted approach minimises environmental impact, conserves resources, and promotes healthier crop production.

The technology used affects the optimal dosage, fertiliser savings, equalisation of the nitrogen balance and its enhanced utilisation, which impacts the yield potential, yield growth and increased grain quality. Proper application of nitrogen fertilisation adapted to plant requirements prevents increased vegetative development – unproductive tillering of plants. Plants fertilised with nitrogen are characterised by an increased amount of water in the tissues, and thus more vulnerable to mechanical damage, which means they can become dislodged during rainfall and strong winds. The consequence is increased susceptibility to attack by pests and pathogens, difficult harvesting and loss of crop.

How this is Inspirational for others

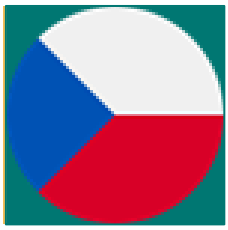
The StopCHwastom app offers a practical, scalable model for small to medium farms by simplifying weed control through accessible technology.

Using the application shortens the time to make a decision on the plant protection product used and significantly increases the effectiveness of the herbicide used - this improves the financial condition of the farm at a minimal cost, because the Stop Weeds Application is available at a very low price.

Its cost-effective and efficient approach can inspire farmers to adopt precision agriculture practices, reducing chemical use and environmental impact while maintaining crop health. This model is easily transferrable to diverse farming contexts where sustainable, budget-friendly solutions are valued

USEFUL LINKS

- YouTube
- ISARIA



CZECHIA

The Bromil Farm

Type of technology used:

- ✓ Smart Sensors
- ✓ Internet-of-Things
- ✓ Soil monitoring
- ✓ UAV

Does the Practice relate to hardware, software or both?

- ✓ Hardware

The Bromil is a small family Czech farm focused on the production of fruit and fruit products. On 150 hectares they take care of thousands of sour cherries, plums, pears, apples and apricots trees.

The offer of fruit products includes juices, syrups, ciders, and dried fruits, which they deliver weekly to primary schools in the area, as well as fruit brandies such as plum brandy, pear brandy, or sour cherry brandy. Thanks to the extensive orchards, they have also been engaged in beekeeping since 2009, when they have 99 beehives and offer honey products and mead. The portfolio is further complemented by the production of lavender and the operation of a composting plant, to which plant material from surrounding villages is transported.

How is this technology being used?

Technologies focus on technological innovations in the field of orchards using various sensors (soil, air), weather stations, soil, and tree monitoring technologies, as well as highly advanced and complex digital systems providing data processing and decision support tools.

Sensors for measuring the temperature and humidity of air and soil are placed in selected places in the orchard, and data is continuously measured and sent to a central database. The farmer has online access to these data or reports and can do efficient irrigation and apply fertilizers and sprays. Every two years, the orchard is photographed by thermal, RGB, and multispectral cameras, and the obtained data is processed and analyzed, e.g., for identification of less productive trees, spacing, or calculation of vegetation indices to determine the condition of the trees.

The Bromil Farm

The Technology's Sustainable Impact

The main objective is to improve the time efficiency of agricultural work depending on the type of fruit and the ecological situation.

This is mainly about increasing the production of growers while reducing costs and reducing negative impacts on the environment, such as the careful use of water, fertilizers, and sprays, reducing the use of pesticides, and alleviating the reporting burden. Another objective is to effectively manage orchards and fruit production, including monitoring tree health.

How this is Inspirational for others

This case study of Bromil's automated orchard management is inspirational as it demonstrates how small farms can leverage advanced sensor and IoT technology to improve efficiency, conserve resources, and reduce environmental impact.

Small orchard farms usually need to collect accurate sensor data, and large farms often measure with inaccurate sensors. In some cases, the problem is the need for more spectrum or volume of data measured (in terms of time and geography). Where data exists, the need for more effective data processing and decision support tools for agricultural interventions and agro management is a major problem.

Farmers, members of non-profit organizations, policymakers, and agricultural advisors are working with technology suppliers and researchers to evaluate technologies that will help small orchard farms establish automation of irrigation and monitoring of climatic conditions in the orchard while achieving:

- savings in water and pesticide use
- reduction of the impact of adverse weather on crops
- reduction of negative impact on the environment, and
- improved efficiency regarding reporting obligations.

USEFUL LINKS

- Bromil
- Facebook

Měcholupská Farm

Type of technology used:

- ✓ Lely Astronaut A5 robots
- ✓ Robotics & Automation
- ✓ Internet of Things
- ✓ Smart Sensors
- ✓ Big Data analytics

Does the Practice relate to hardware, software or both?

- ✓ Hardware
- ✓ Software

This large company farm, in Western Bohemia, Czechia focuses on the automation of plant production, animal production and electricity production through a biogas plant.

In animal production, the company specialises in cattle breeding in a robotic stable. The new barn has milking robots, eight Lely Astronaut A5 robots. The robot is equipped with the measurement of somatic cells, fat, protein, temperature and colour of milk. Another feature of the robots is the animal scale, which makes it possible to monitor weight loss, especially in the postpartum period (monitoring the condition of the cows). With the help of the obtained data, zootechnicians can detect health problems in time. The stable is equipped with an autonomous weather station that regulates the opening/closing of the perimeter sails of the stable.

How is this technology being used?

Měcholupská zemědělská, a.s. integrates advanced technologies across its operations to enhance efficiency and sustainability.

Farms typically do not collect accurate sensor data, and large farms often measure with inaccurate sensors. In some cases, the problem is the lack of spectrum or volume of measured data (in terms of time and geography). Where data exist, the main problem is the lack of effective tools for data processing and decision support for agricultural and breeding interventions. On this farm the various technologies are being used to:

- minimise water and pesticide use
- reduce the impact of adverse weather on crops
- reduce the negative impact on the environment
- improve efficiency in reporting obligations
- Enhance the detection of somatic cells in milk
- Improve monitoring of the condition of cows, etc.

Měcholupská Farm

The Technology's Sustainable Impact

This case study highlights how digital and robotics tools like the Lely Astronaut A5 robots can enhance operations and improve costs.

The primary goal is to enhance the time efficiency of agricultural tasks by adapting to crop types and environmental conditions, while simultaneously increasing production and reducing costs. This approach minimises negative environmental impacts through the careful use of water, fertilisers, and pesticides. Additionally, the collected data enables timely detection of health issues in farmed animals, further supporting sustainable and efficient farm management.

How this is Inspirational for others

This case study is inspirational as it highlights the integration of advanced automation and IoT in plant, animal, and electricity production to enhance efficiency and sustainability. .

By leveraging technologies such as robotic milking systems, autonomous weather stations, and biogas plants, it demonstrates how data-driven practices can improve animal health, optimise resource use, and reduce environmental impact. This holistic approach encourages other farms to adopt innovative solutions for sustainable growth

USEFUL LINKS

- Mecholupska
- Facebook

Mlyn Podhora Farm

MLÝN PODHORA

Type of technology used:

✓ Internet of Things
✓ Smart Sensors

Does the Practice relate to hardware, software or both?

✓ Hardware

This small farm, in Western Bohemia, Czechia focuses on growing vegetables and breeding fish. It uses sensors in an automatic weather station.

The small farm Josef Krůs grows 25 types of vegetables and 150 varieties without the use of industrial fertilizers (organic fertilizers) . Strawberries without the use of herbicides. Due to the size of the farm, the machinery is limited to only the necessary equipment. The foundation of the farm is the evaluation of inputs and the search for technological solutions that facilitate farming according to the budget.

How is this technology being used?

This farm uses the JOTIO Tech system to obtain detailed information about the soil block.

The technology specializes in introducing modern technologies into agriculture, especially in the field of vegetable growing. A key element of their innovative approach is the use of soil and air sensors that measure important factors such as soil moisture temperature and nutrient content. This data helps the farm to understand the needs of plants accurately and work with them more efficiently, thereby minimizing the waste of resources. The company also uses weather stations that monitor current weather and forecasts, such as precipitation, temperature, or humidity. Thanks to this, the farm can better adjust irrigation, fertilization, or plant protection against adverse effects (for example, from late spring frosts).

Mlyn Podhora Farm

The Technology's Sustainable Impact

The JOTIO Tech system offers agricultural enterprises modern weather stations that provide detailed meteorological data necessary for the effective management of agricultural operations.

These stations operate autonomously, communicate with the server via a SIM card, and are powered by a solar panel.
They record air and soil temperature and humidity, ground temperature, wind speed, and direction, including gusts, precipitation amount, and leaf wetness level. This data is available both in real-time and in historical reports. Thanks to them, farmers can more accurately plan irrigation, fertilization, or plant protection, thereby optimizing field processes and minimizing losses.

How this is Inspirational for others

JOTIO Tech offers a practical, scalable model for small farms that need to know soil moisture, weather, and more in order to respond to weather fluctuations.

The JOTIO Tech system brings advanced technologies directly to agriculture, helping businesses increase the efficiency and sustainability of their production. Weather stations are becoming an indispensable assistant in managing farming activities, taking into account current and future environmental conditions.

USEFUL LINKS

- Mlynpodhora
- Facebook

VESA Velhartice a.s.

Type of technology used:

- ✓ Internet of Things
- ✓ Smart Sensors

Does the Practice relate to hardware, software or both?

- ✓ Hardware

The Vesa Velhartice farm is engaged in breeding new quality potato varieties, propagating potato seedlings, trading in seed, consumer and industrial potatoes, and, last but not least, providing advice to potato growers and users.

The company manages approximately 430 hectares of agricultural land, and its Czech potato varieties are gaining popularity and are successful throughout Europe. They use automatic weather stations and environmental sensors both outdoors and indoors (greenhouses where potato varieties are bred from seeds). In particular, the aforementioned greenhouses are closed microclimatic systems with precise sensors. The company also operates a unique automatic potato vending machine, where customers can buy potatoes almost at any time.

How is this technology being used?

A network of environmental sensors is implemented to monitor climatic conditions in breeding greenhouses.

The implemented technology is focused on the management of potato variety breeding using various environmental sensors for monitoring the temperature and humidity of air, soil, and sunlight in closed microclimate greenhouses. The data is automatically sent to a central data warehouse, from which reports are created for users. Based on these measured data, the required optimal climatic conditions can be very precisely determined and maintained.

VESA Velhartice a.s.

The Technology's Sustainable Impact

Thanks to precise measurement of current environmental conditions, microclimatic conditions in greenhouses can then be accurately maintained.

The main goal is to improve the efficiency of agricultural work in breeding potato varieties depending on the type of potato and the environmental situation, and thus increase the production of growers of the bred potato varieties while reducing costs and reducing negative impacts on the environment.

How this is Inspirational for others

The implementation of sensors in Vesa Velhartice's greenhouses is a clear demonstration of the effective use of IoT in practice.

This use of sensors to support the maintenance of microclimatic conditions in the greenhouse can be implemented for any case of plant cultivation, i.e., not only in the case of variety breeding but also for the production cultivation of fruits and vegetables. IoT sensors provide continuous monitoring of various quantities. This monitoring can be implemented in most cases using battery-powered sensors with remote data transmission. The most important sensors are air temperature and humidity sensors, soil temperature and humidity sensors, sunlight length sensors (for the need to shade the greenhouse from direct sunlight or the need for artificial lighting), or gas sensors, e.g., CO2.

When measuring air temperature, it is important to ensure that the thermometer itself is shaded so that the measurement is not affected by thermal radiation. For this purpose, sensors are equipped with so-called radiation shields. When choosing a sensor, it is important to pay attention to the technical solution itself; where humidity is a dangerous factor for electrical equipment, so it is important that the manufacturer of the device has adequately solved the sealing of the device while being able to measure humidity reliably and for a long time.

It is important that the solution used does not degrade over time (corrosion resistance, etc.), and different soil compositions have different parameters so that the data can be compared with each other; it is necessary to calibrate the sensor using a direct method for determining soil moisture, for each measuring point separately. Also, measurements in an air pocket (created, for example, by a rodent) will not provide quality data.

USEFUL LINKS

- Vesa Velhartice

VOSPOL

Type of technology used:

- ✓ Robotics & Automation
- ✓ Internet of Things
- ✓ Smart Sensors
- ✓ Big Data analytics

Does the Practice relate to hardware, software or both?

- ✓ Hardware
- ✓ Software

Vospol was founded thirty years ago with the aim of becoming a major player in the field of livestock production. Since its inception, it has focused on fattening pigs, turkeys, broilers and laying hens. Thanks to many years of experience and constant investments in modernization, the company has become one of the leading suppliers of quality meat and eggs on the domestic market.

Over the years, Vospol has significatly developed and expanded its activities. In addition to livestock production, it has also started to focus on the area of biomass.

Vospol is a private company engaged purely in animal production without fields. According to the situation, the breeding number is 21 thousand chickens or 20 thousand broilers. It also has 24,000 chickens in an adjacent building. The company uses a fully automated hall for more than 40,000 chickens.

How is this technology being used?

Vospol integrates several technologies across its operations to automate and optimise feeding, watering, ventilation, weighing, and monitoring, ensuring efficient, error-free operations and improved animal welfare.

For the transport of feed mixtures, they installed a Roxell spiral conveyor, which is characterised by high quality, trouble-free, long service life, and above all gentle transport of different types of feed. Four feeding lines including a MINIMAX feeding bowl. They have also equipped the hall with five Roxell feed lines with the Swii'Flo nipple feeding system, which provides all animals with fresh clean water at all times.

The hall has a combination of pulse and tunnel ventilation, which is controlled by an AGE-VENT 300+ control unit. This control unit for the feeding, watering, weighing of animals, and lighting has remote access including a monitoring camera system. The ventilation control is set in advance for the entire tour. This means that the operator does not have to actually interfere with the ventilation control, eliminating human error. Heating is provided by four ERMAF RGA natural gas heaters with exhaust fumes extracted outside the stable.

Weighing of the silos and broilers is provided by a strain gauge weight sensor assembly. For the weighing of broilers, there are stepping boards on which the animals hop. The hanging scale is connected via a digital converter to the AGE-VENT 300+ control unit, which displays/saves the measured values..

VOSPOL

The Technology's Sustainable Impact

This case study highlights how technology can improve, create and long-term maintain a suitable microclimate in the stables for breeding poultry and allow for successful management

The most modern hall has been in operation since 2024. A Roxell spiral conveyor has been installed here for the transport of feed mixtures. Four feeding lines including a MINIMAX feeding bowl. The unit controls and corrects ventilation, feeding, watering, animal weighing and lighting and has remote access including a monitoring camera system. Heating is provided by four ERMAF RGA heaters on natural gas with exhaust outside the stable. Weighing of chickens and broilers is ensured here by a set of strain gauge weight sensors. For weighing broilers there are stepping plates on which the animals jump.

How this is Inspirational for others

The Vospol farm can be inspiring in the use of modern technologies, how innovative technical solutions can be used to make livestock production more efficient. The modern approach supports not only productivity, but also the sustainability of the operation.

This farm inspires with the use of modern technologies and innovations, which it uses for efficient animal husbandry. The installation of a Roxell spiral conveyor for transporting feed mixtures ensures reliable operation and a long service life, which minimizes problems associated with feeding logistics.

Furthermore, you can be inspired by advanced systems such as the Swii'Flo water supply system, which guarantees a constant supply of clean water, and fully automated ventilation controlled by the AGE-VENT 300+ unit. This unit allows for control of ventilation, feeding, watering, animal weighing and lighting with the possibility of remote access and camera monitoring, thus eliminating human errors and increasing efficiency.

Another inspiring element is the use of a modern method of weighing animals using strain gauge sensors and digital connection to the control unit. This technology allows for accurate monitoring of animal weight and optimization of their growth. This approach can achieve higher productivity, reduce operating costs and ensure maximum comfort and health of the animals.

USEFUL LINKS

- VOSPOL

IRELAND

Emerald Greens

Type of technology used:

- ✓ Vertical farming
- ✓ Hydroponics
- ✓ PV panels

Does the Practice relate to hardware, software or both?

- ✓ Hardware

The company Emerald Greens is revolutionising Irish agriculture with its pioneering approach to sustainable vertical farming.

Emerald Greens founder and CEO Brian O'Reilly has a long track-record as a grower having run a successful mushroom operation for 30+ years in Tipperary. In 2019 Brian decided to move away from mushroom production and set up a vertical farming venture in its place. He sourced the best hydroponic system available, kitted out his grow tunnels and Emerald Greens was born. This is Ireland's first and largest vertical farm. They are leading the way in controlled environment farming, producing award-winning crops on vertical shelves under LED lights in the grow houses. The plants are nurtured in water only, in an eco-friendly way that eliminates the need for pesticides or herbicides. This extremely efficient system means that they produce fresher, tastier, crops for the Irish market all year round.

How is this technology being used?

Emerald Green uses the hydroponic system to produce herbs, mixed greens, Asian greens, and baby leaves.

They are grown in tiny pods on shelves with the roots stretching down to nutrient-rich water. Bright LED lights encourage the growth, as does hot air blowing into the tunnel.

A wind turbine nearby and their on-site PV panels, generate electricity and a hot humid house means the plants thrive. But the lights are also powered down for hours to allow the plants to sleep.

It looks a million miles from any conventional farm. The tunnel is filled with rows of white plastic shelves, with tiny holes through which the plants appear. Water circulates under the shelves and overhead there are strips of lighting; white, red, and blue.

It is bright and humid with the constant hum of air being pumped in and there is a gentle trickle of water flowing through the system.

Emerald Greens

The Technology's Sustainable Impact

Sustainability is at the core of this business model and the company tagline is "all taste, NO waste"

The hydroponic system they are using allows for a drastic reduction in food miles. 15,000 tonnes of lettuce are imported to Ireland annually, their products are eaten locally, thus impacting travel costs and its carbon footprint.

Agriculture is the largest user of water globally. By 2050, the sector is expected to account for more than half of all withdrawals from rivers, lakes, and aquifers. Vertical farms' highly controlled indoor environments reduce water consumption to a mere trickle – 95% less than traditional farming – by capturing and reusing the water that evaporates from the growing plants.

They use zero pesticides, herbicides and fungicides as their grow houses are completely sealed off from the outside environment. As a result, the food grown is healthier, safer, and ready to eat right out of the container with no washing needed.

Soil degradation is becoming an enormous problem globally. In the past 150 years it's estimated that we've lost roughly half of our planet's topsoil. Problems like erosion, compaction, loss of soil structure, and nutrient degradation all play a role in this crisis. Vertical farms use no soil at all, so they don't contribute to the dilemma. Additionally, the more vegetables, etc that are grown inside a hydroponic system, the lighter the load is on the planet for crops that can't be grown hydroponically. Finally, the operation is powered by its own wind turbine.

How this is Inspirational for others

The story of Emerald Greens showcases how innovative thinking and a commitment to sustainability can transform traditional agriculture into a future-focused, eco-friendly enterprise.

By embracing vertical farming and prioritising local, pesticide-free produce, the company demonstrates a scalable model for reducing environmental impact while meeting market demand obligations.

Breaking away from high-intensity conventional farming could be seen as an option for more farmers. Leading to more local food in more controllable and predictable circumstances. The high impact in terms of sustainability could be seen as a large motivational factor.

USEFUL LINKS

- Website
- LinkedIn
- Instagram

Treemetrics

Type of technology used:

- ✓ Big-data Analytics
- ✓ Smart Sensors
- ✓ Satellite communication technology

Does the Practice relate to hardware, software or both?

- ✓ Software
- ✓ Hardware

Treemetrics has developed an innovative and dynamic management system for natural resources.

Treemetrics Ltd. was founded in 2005 by Enda Keane and Garret Mullooly. This software-based company has spent several years developing new technology to replace the traditional forestry methods that have been in place for 100+ years. They have become the '*Internet of Trees*' IoT. This innovative and dynamic management system for natural resources provides a wide range of tools to analyse, manage and display the available data in sensitive areas, including earth observation and field data.

Treemetrics' solution utilises recent technological advances in mobile applications, remote sensing, data mining and satellite communications technology and tailors them for maximum benefit for forestry. ***ForestHQ Climate-Smart*** Platform provides tools for sustainable adaptive forest management that protect and enhance the potential of forests to adapt and mitigate climate change while maximising efficiency

How is this technology being used?

The technology developed by Treemetrics is allowing for the good or more informed and accurate management regimes of forests by giving a good understanding of the forest composition.

It can give accurate carbon sequestration estimates for each species and forest type, and a simulated breakdown of the timber products to optimise the use of each product and maximise its carbon sequestration in the long term.

ForestHQ enables users to:

- Easily create and structure their forestry database
- Allow it to sync with other data sources and systems via API's
- Import existing data eg Maps, Inventories

Treemetrics

The Technology's Sustainable Impact

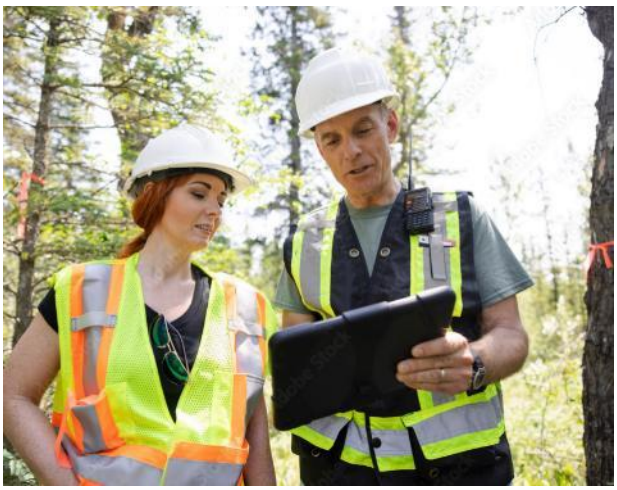
The Forest HQ platform allows the agri-forest sector to increase the climate benefits of their forests with their forest management and monitoring capabilites that integrate all the users required forestry data.

Their mapping and measurement tools facilitate the sustainable management of forest stands with complex structural composition and functional diversity (e.g. species selection, multiple species, uneven age, continuous canopy forest, etc.). Treemetrics are also providing Stakeholders (e.g. Farmers & Communities) with access to skills and technologies to help with management adaptation and mitigation challenges.

How this is Inspirational for others

Treemetrics and the Forest HQ platform could be inspirational for others as it allows users to:

- Take ownership of their forest measurement (reduce costs and improve productivity)
- Learn best practices and make it easy
- Generate different Production Zones
- Measure with their phones
- Put a value on the forest based on the products it can produce
- Utilise the latest Satellite &/or Drone Imagery
- Generate and Share Reports Easily.



USEFUL LINKS

- Website
- Facebook
- Twitter/X
- Instagram

Cotter Agritech Ltd.

Type of technology used:

- ✓ Data Analytics
- ✓ Smart Sensors
- ✓ Internet-of-Things

Does the Practice relate to hardware, software or both?

- ✓ Software
- ✓ Hardware

Cotter Agritech , is an innovative company specialising in agricultural technology.

This company was founded by farmers and brothers Jack and Nick Cotter, who have developed the Cotter Crate, a sheep-handling system, and the SmartWorm app.
The company focuses on reducing labour costs, improving animal welfare, and tackling worm resistance by reducing worming product use by 40%. Their products offer an efficient and humane solution for sheep handling, making the management of livestock easier and more sustainable.

How is this technology being used?

The Cotter Crate device and the App are making farm management more efficient and sustainable.

The Cotter Crate is a sheep-handling device that simplifies tasks such as dosing, vaccinating, and weighing, while the SmartWorm app uses data to optimise worming practices. This combination reduces handling time, labour costs, and worming product usage, making farm management more efficient and sustainable.
Patented, stainless steel design that takes the sheep's feet out of contact with the ground, so the animal is fully immobilised for your safety and theirs. It allows farmers to handle adult sheep and lambs at the same time. An entirely mechanical operation - no electricity or air is required. It eases the physical burden of Sheep/Lamb handling and improves efficiency.

The technology also includes smart sensors to monitor and manage sheep handling tasks, contributing to a calmer experience for both handlers and livestock.

Cotter Agritech Ltd.

The Technology's Sustainable Impact

This technology supports sustainable agriculture by optimising resource use and reducing chemical inputs, which lowers the environmental impact. Additionally, it enhances animal welfare, contributing to a more eco-friendly farming system

Cotter Agritech's solutions help reduce the environmental impact of sheep farming by optimising resource use, reducing chemical inputs, and enhancing animal welfare. The reduction in worming product use contributes to slowing the development of worm resistance, a significant issue in sustainable livestock farming. Their Smart worm App follows the principle of **Targeted Selective Treatment** (TST) where the minimum number of animals are treated. This is done, not based on the number of worms, but on the impact on production, as that's what's important. With TST, only the ones negatively impacted by worms are therefore treated. Everything else is left untreated, including lambs who may have some worms but are not affected by them. TST is an excellent parasite control strategy because it eliminates the infection in negatively affected animals, but it's much more cost-effective than blanket treatment and prevents resistance.

These technologies promote more efficient farming practices, leading to lower operational costs and a reduced ecological footprint.

How this is Inspirational for others

Cotter Agritech demonstrates how combining innovative hardware with smart software can revolutionise farm management.

Their approach shows that small-scale, farmer-driven innovations can have a significant impact on the broader agricultural sector. By addressing common challenges with practical solutions, they inspire other farmers to adopt technology that enhances productivity, animal welfare, and sustainability.

USEFUL LINKS

- Website
- Facebook
- Twitter/X
- Instagram
- YouTube

Herdwatch

Type of technology used:

- ✓ Big-Data Analytics
- ✓ Automation
- ✓ Cloud based storage

Does the Practice relate to hardware, software or both?

- ✓ Software

Herdwatch is a farm management software platform designed to simplify farm operations by reducing paperwork and improving decision-making.

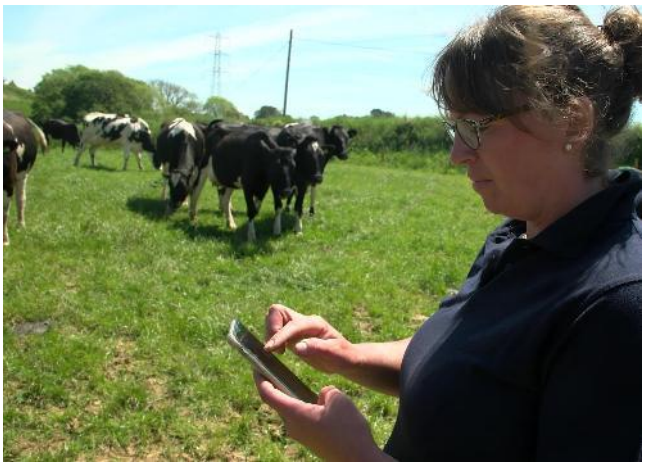
The platform is used on over 18,000 farms, offering features for livestock management, compliance, and record-keeping. It integrates seamlessly with national agricultural databases, providing farmers with a reliable and easy-to-use tool for managing their farms efficiently. The app is cloud-based and also works fully offline, making it a truly valuable farm tool. It eliminates the need for farmers to carry out time-consuming paperwork.

herdwatch

How is this technology being used?

Herdwatch technology is used to simplify farm operations by providing a mobile app that allows farmers to record and access real-time data on livestock movements, health, breeding, and compliance.

Herdwatch uses big-data analytics to enable farmers **to record and access farm data in real-time** through a mobile app. This technology simplifies herd management by allowing farmers to track livestock movements, health, breeding, and compliance directly from their smartphones. It provides instant access to crucial information, helping farmers make informed decisions and maintain compliance with agricultural standards.



Herdwatch

The Technology's Sustainable Impact

Herdwatch contributes to sustainable agriculture by enabling farmers to monitor and manage their carbon emissions effectively.

Herdwatch promotes sustainability by reducing the need for paper records and minimising errors in farm management. The platform's Farm-to-Fork Data Integration system allows for precise tracking of inputs such as fertilisers, feeds, and transportation, facilitating accurate carbon footprint calculations and promoting transparency throughout the supply chain.

The app therefore allows for more efficient resource use, better herd health management, and streamlined compliance with agricultural standards, contributing to more sustainable farming practices. This helps farmers reduce waste, improve productivity, and ensure long-term farm viability..

How this is Inspirational for others

Herdwatch highlights the potential for accessible and innovative solutions to enhance agricultural outcomes and sustainability.

Herdwatch serves as a model for how technology can simplify farm management, making it accessible and efficient. By reducing the administrative burden, it allows farmers to focus more on productive activities, leading to better farm outcomes. This approach can inspire other farmers to adopt digital tools, enhancing their productivity and sustainability while ensuring compliance with evolving agricultural standards.

USEFUL LINKS

- Website
- Facebook
- Twitter/X
- LinkedIn
- YouTube

National Genotyping Programme

Type of technology used:

- ✓ Big-Data Analytics
- ✓ Artificial Intelligence

Does the Practice relate to hardware, software or both?

- ✓ Software

Irish Cattle Breeding Federation (ICBF) National Genotyping Programme is a national initiative in Ireland aimed at enhancing the genetic quality of the national cattle herd.

By using advanced genotyping technologies, the programme assists farmers in making better breeding decisions, improving herd performance, and contributing to sustainable farming practices. The programme's goal is to increase the profitability and efficiency of Irish cattle farming while maintaining high standards of animal welfare and environmental stewardship

How is this technology being used?

The National Genotyping Programme uses genetic testing and big-data analytics to provide farmers with detailed insights into the genetic traits of their herds.

The National Genotyping Programme (NGP) is a collaborative initiative in Ireland aimed at achieving a fully genotyped national cattle herd. It operates on a cost-sharing model involving the Department of Agriculture, Food & the Marine, the beef and dairy industries, and participating farmers. The programme utilises advanced genotyping technologies (integrating data from various sources, applying AI and machine learning) to provide farmers with detailed insights into the genetic traits of their herds, enabling informed breeding decisions that enhance herd performance and sustainability. By confirming parentage and identifying superior animals for breeding, the NGP contributes to more efficient and environmentally friendly farming practices, supporting the long-term viability of cattle farming in Ireland.

National Genotyping Programme

The Technology's Sustainable Impact

The National Genotyping Programme (NGP) in Ireland is significantly enhancing agricultural sustainability by:

Accelerating Genetic Improvement: By providing detailed genetic profiles, the NGP enables farmers to make informed breeding decisions, leading to healthier, more productive herds with improved fertility and disease resistance. This advancement enhances farm efficiency and profitability.

Reducing Greenhouse Gas Emissions: Selecting for traits associated with lower methane production and better feed efficiency contributes to a reduction in the carbon footprint of cattle farming, aligning with Ireland's climate action targets.

Enhancing Traceability and Food Safety: The programme establishes a DNA-verified traceability system, ensuring full transparency from farm to fork. This system bolsters consumer confidence and supports Ireland's reputation for high-quality, safe agricultural products.

Promoting Sustainable Breeding Practices: By identifying and propagating desirable traits, the NGP supports breeding strategies that are both economically viable and environmentally sustainable, fostering long-term resilience in the agricultural sector.

How this is Inspirational for others

The National Genotyping Programme (NGP) serves as an inspiration for farmers globally by demonstrating how advanced genetic technologies can drive sustainability and profitability in agriculture.

The ICBF National Genotyping Programme serves as a blueprint for integrating science and technology into traditional farming, demonstrating the power of data-driven decisions to:

Enhance Productivity: By optimising breeding strategies, farmers can achieve healthier herds with higher yields, improving overall farm efficiency.

Support Climate Goals: Reducing greenhouse gas emissions and improving resource use exemplifies how farms can align with environmental targets while maintaining profitability.

Strengthen Consumer Trust: The DNA-verified traceability system builds confidence in the quality and safety of agricultural products, a model that other farmers can replicate to improve marketability.

Adopt Scalable Solutions: The programme shows how integrating technology into traditional farming can be both feasible and impactful, inspiring others to embrace innovation for sustainable growth.

USEFUL LINKS

- Website
- YouTube
- LinkedIn

SLOVAKIA

Gamota JR. s.r.o.

Type of technology used:

- ✓ Smart Sensors
- ✓ Artificial Intelligence

Does the Practice relate to hardware, software or both?

- ✓ Software

Gamota JR. s.r.o. is a subsidiary of the Gamota group, active in the fields of agriculture, forestry, fish farming, and foreign trade. Their main activity is the production of soybean oil and soybean expeller.

As the parent company advanced rapidly, they invested in its further development. Thanks to this and good managerial decisions, today they have the potential to contribute to the development and future of the Slovak agricultural industry.

This subsidiary focuses its activity on– soybean cultivation. They place great emphasis on non-GMO policy. Based on their rich experience they are working to spread this conviction and philosophy all over Slovakia. The production of premium GMO-free virgin soybean oil (GamoSoy) and the GMO-free soybean expeller (SoyProFat) has already emerged from their activities.

How is this technology being used?

Gamota JR employs a solvent-free pressing method to extract virgin soybean oil, ensuring the final product is free from chemical residues and retains a high lecithin content, beneficial for health.

This approach aligns with their commitment to non-GMO products, addressing consumer demand for genetically unmodified foods. The technology combines measurements from new sensors, scientific knowledge from databases of the physiological need for individual irrigation doses for a specific plant and data on environmental factors that are on the company's server. Based on this data, the machine learning algorithm will help the manager to determine the irrigation dose.

Gamota JR. s.r.o.

The Technology's Sustainable Impact

The Artificial Irrigation Management System enhances agricultural sustainability by optimising water use, reducing waste, and minimising environmental impact.

It integrates sensors, weather data, and AI to provide precise irrigation, conserving water and energy while preventing soil erosion and runoff. The system also empowers farmers with data-driven insights, reducing labour and improving productivity. Economically, it offers cost savings through efficient resource use and increased yields, making farms more resilient to climate change. By supporting sustainable farming practices, it aligns with global sustainability goals like SDG 6, 12, and 13.

How this is Inspirational for others

Gamota JR's approach serves as an inspiration for other farmers by demonstrating how advanced technology can lead to more efficient and sustainable farming.

By adopting data-driven irrigation, farmers can significantly reduce water and energy waste, lower costs, and boost crop yields. The system's ability to automate complex tasks empowers farmers to make informed decisions, improving both productivity and quality of life. As it aligns with global sustainability goals, this technology showcases how embracing innovation can enhance farm resilience and contribute to a more sustainable agricultural future.

USEFUL LINKS

- Website
- More information
- YouTube

AgriCon

Type of technology used:

- ✓ Smart Sensors
- ✓ Internet-of-Things
- ✓ Big Data analytics

Does the Practice relate to hardware, software or both?

- ✓ Software
- ✓ Hardware

AgriCon is a leading provider of digital plant cultivation solutions in Central and Eastern Europe, founded in 1997.

The company specialises in precision farming, offering advanced tools and technologies that help farmers optimise the use of their machinery, resources, and time. AgriCon's innovations, such as the YARA N-Sensor and agriCLOUD, enable precise and efficient crop management, enhancing yield and reducing environmental impact. The company focuses on integrating digital systems into agricultural practices, ensuring that each square meter of farmland is managed optimally. AgriCon's solutions are known for improving decision-making in plant cultivation, contributing to sustainable and productive agriculture.

How is this technology being used?

AgriCon uses advanced digital technologies, including smart sensors and software, to enhance precision farming.

After taking stock of your farm together, AgriCon will draw up a personalised implementation plan for your farm. They supply and install the necessary technical infrastructure such as plant sensors and soil information, set up a complete data management system, train you and your employees and advise you directly on your fields. Smart sensors collect real-time data on soil conditions, crop health, and environmental factors, which is then analysed through AgriCon's software systems. This data-driven approach allows farmers to make informed decisions on fertilisation, irrigation, and crop management, optimising resource use and improving yields.

The integration of IoT technology enables seamless communication between devices, ensuring that every aspect of farm management is precisely controlled, leading to increased efficiency, reduced environmental impact, and sustainable agricultural practices.

There are three major application areas in field agriculture:

- Automation of the work of tractors and equipment,
- Digitisation of the office and
- Precision farming, which is also known as sub-area-specific crop cultivation.

AgriCon

The Technology's Sustainable Impact

AgriCon's technology significantly contributes to sustainable agriculture by optimising the use of resources like water, fertilisers, and pesticides.

The smart sensors and precision farming software collect and analyse real-time data, allowing farmers to apply inputs only where and when they are needed. This targeted approach reduces waste, minimises environmental impact, and enhances soil health. By increasing the efficiency of farm operations, the technology also helps in lowering greenhouse gas emissions and conserving biodiversity, ultimately supporting long-term agricultural sustainability and resilience.

How this is Inspirational for others

AgriCon's approach can inspire other farmers by demonstrating the tangible benefits of integrating digital technologies into traditional farming practices.

By adopting smart sensors, precision farming software, and data-driven decision-making, farmers can significantly improve resource efficiency, reduce costs, and increase yields. This method also shows how technology can make farming more sustainable by minimising environmental impact through targeted input applications.

The success of AgriCon underscores the potential for innovation in agriculture, encouraging farmers to embrace new tools and strategies to enhance productivity while protecting natural resources.

USEFUL LINKS

- Website
- Facebook
- Instagram
- YouTube

Kopek Bakery

Type of technology used:

- ✓ Fermentation and Circular Economy Technology

Does the Practice relate to hardware, software or both?

- ✓ Hardware

The Betaferm technology, implemented at Kopek Bakery is designed to enhance sustainability by addressing food waste through innovative fermentation processes.

This technology upcycles bread waste into valuable by-products, such as animal feed or new food ingredients, embodying the principles of the circular economy. By integrating these processes, Betaferm not only minimises food waste but also ensures that resources are efficiently reused within the food supply chain, promoting a more sustainable and eco-friendly approach to food production

How is this technology being used?

The Betaferm technology is used at Kopek Bakery to reduce food waste and enhance sustainability by converting bread waste into valuable by-products through fermentation.

This process upcycles discarded bread into animal feed or new food ingredients, effectively minimising waste and contributing to a circular economy. The technology integrates with existing production systems, ensuring that leftover bread is not discarded but instead transformed into useful resources. This approach not only reduces the environmental impact of food production but also adds value to what would otherwise be waste, promoting a more sustainable food supply chain

BETAFerm

Kopek Bakery

The Technology's Sustainable Impact

The Betaferm technology helps the food & agricultural sectors achieve sustainable impact by transforming bread waste into valuable by-products

By creating animal feed as a bi-product this technology reduces the need for additional agricultural resources to produce these feeds. This process minimises food waste and promotes resource efficiency, key principles of the circular economy. By diverting waste from landfills and reducing the demand for raw materials, Betaferm lowers the environmental footprint of both the food and agricultural sectors. Additionally, it contributes to sustainable farming by providing farmers with high-quality, eco-friendly feed options, thus supporting a more sustainable and circular food supply chain

How this is Inspirational for others

The Betaferm technology can inspire other farmers by demonstrating the value of integrating circular economy principles into agricultural practices.

By upcycling food waste into valuable by-products like animal feed, this approach showcases how waste can be turned into a resource, reducing the environmental impact and improving farm sustainability. Farmers can adopt similar practices to minimise waste, lower costs, and contribute to a more sustainable food system. This approach encourages innovation in resource management, showing that even waste products can have economic and environmental value when managed effectively

USEFUL LINKS

- More information

TBS, a.s.

Type of technology used:

✓ Non-thermal processing technologies

Does the Practice relate to hardware, software or both?

✓ Hardware

TBS, A.S. is a diversified agro-tourism and agricultural company in Myjavinian Kopanice, managing nearly 300 hectares of organic farmland.

The company operates Agro-farm Charolais and Agropenzion Adam, offering tourist services, including a guesthouse with a dining hall. Specialising in organic cattle farming, TBS produces beef for its restaurant, emphasising a farm-to-table experience. Certified in organic farming since 2002, the company also promotes regional dishes as branded organic products. TBS employs 35 people, integrating agricultural production with tourism to provide guests with unique, nature-based experiences.

How is this technology being used?

TBS, a.s. employs advanced non-thermal processing technologies to preserve the nutritional quality of their fruits while ensuring microbial safety and extending shelf life

The non-thermal processing technologies used include; high hydrostatic pressure, pulsed electric fields, and ultrasound. The company then integrates automated systems and smart sensors to monitor and control each stage of the fruit processing workflow, from sorting and washing to packaging. These technologies enhance efficiency, reduce energy consumption, and ensure consistently high-quality outputs, making TBS a leader in sustainable food processing practices that prioritise both product quality and environmental responsibility.

TBS, a.s.

The Technology's Sustainable Impact

The non-thermal processing technologies used by TBS, A.S. significantly contribute to the agricultural sector's sustainability.

By preserving the nutritional quality of fruits and extending their shelf life, these methods reduce food waste and minimize the need for chemical preservatives. The use of automated systems and smart sensors optimizes resource use, lowering energy consumption and water waste during processing. This approach not only enhances the efficiency and profitability of agricultural operations but also promotes environmental stewardship by reducing the overall ecological footprint of food production.

How this is Inspirational for others

TBS, A.S.'s approach can inspire other farmers by demonstrating how advanced, non-thermal processing technologies can enhance product quality while promoting sustainability.

By adopting methods like high hydrostatic pressure and smart automation, farmers can preserve the nutritional value of their produce, extend shelf life, and reduce waste without relying on chemicals. This not only increases profitability but also meets the growing consumer demand for healthy, sustainable products. The success of TBS shows that integrating innovative technologies with traditional farming can lead to a more efficient and eco-friendly agricultural model.

USEFUL LINKS

- More information
- Facebook

Vibavi

Type of technology used:

✓ Drones and UAVs

Does the Practice relate to hardware, software or both?

✓ Hardware

Vibavi is a company that specialises in providing advanced drone/UAV services to revolutionise modern agriculture.

They offer precise monitoring of crop health using multispectral imaging, enabling early detection of issues and optimised crop management. Their drones facilitate accurate mapping of field boundaries, efficient pest and wildlife monitoring, and targeted spraying to reduce chemical use. With cutting-edge technology, they enhance productivity, minimise costs, and promote sustainable farming practices, ensuring that their clients achieve higher yields and better resource management.

How is this technology being used?

This technology is transforming agriculture by providing real-time, data-driven insights through drones equipped with multispectral cameras.

Farmers can monitor crop health, identify stress factors, and assess soil conditions with precision. Drones create detailed maps of fields, aiding in precise planting, irrigation, and fertilisation. They also enable targeted spraying of pesticides and herbicides, reducing chemical usage and environmental impact. Additionally, drones monitor livestock and detect potential threats, ensuring timely intervention and improved farm management.

Vibavi

The Technology's Sustainable Impact

This technology used by Vibavi is driving sustainability in agriculture by optimising resource use and minimising environmental impact.

Drones enable precise application of water, fertilisers, and pesticides, reducing waste and runoff. They provide early detection of crop diseases and pest infestations, allowing for targeted interventions that preserve soil health and biodiversity. By improving yield prediction and monitoring field conditions, drones help farmers make informed decisions that enhance productivity while conserving resources, ultimately promoting more sustainable and resilient farming practices.

How this is Inspirational for others

This approach showcases how embracing technology can lead to more efficient, sustainable farming practices.

By adopting drones, farmers can see firsthand the benefits of precise resource management, reduced environmental impact, and improved crop yields. It demonstrates that investing in advanced tools not only boosts productivity but also contributes to long-term sustainability. As other farmers observe these successes, they may be inspired to innovate and adopt similar technologies, driving a collective movement towards more sustainable, high-tech agriculture.

USEFUL LINKS

- Website
- LinkedIn
- Facebook

ITALY

Azienda Agricola Palino

Type of technology used:

- ✓ Automation
- ✓ GPS
- ✓ Sensors
- ✓ Internet-of-Things

Does the Practice relate to hardware, software or both?

- ✓ Hardware
- ✓ Software

The Palino farm, located in a fertile area of 200 hectares in Monti Dauni, Apulia Region, Italy , specialises in the production of cereals, especially wheat, with careful and sustainability-oriented management.

The farm uses crop rotation techniques to maintain soil fertility and integrates the use of advanced technologies such as satellite mapping and sensors to optimise field management. The main objective is to improve production efficiency while reducing the use of resources such as fertilisers and water. The company aims for innovative and sustainable agricultural management, guaranteeing high quality and environmentally friendly products

How is this technology being used?

The Azienda Agricola Palino uses advanced technologies such as autonomous driving and GPS to manage agricultural vehicles, with the support of the ISOBAS system to control trailers.

Fertilisation is georeferenced, with prescription maps loaded onto computers that communicate bi-directionally with the tractors. Decision Support Systems (DSS) software has been used for more than a year to decide when and how to intervene against pests such as pathogens. Pheromone traps, integrated with a digital monitoring system, avoid manual inspections in the olive grove. The harvesters are equipped with sensors to create yield maps, which provide detailed data collected point by point. Among the software used are Tribol, XFARM for farm management, and Fieldview by BYern for yield maps. Sensors connected to the Internet-of-Things monitor soil and leaf moisture, improving the accuracy of operational decision.

Azienda Agricola Palino

The Technology's Sustainable Impact

The farm's use of georeferenced fertilisation optimises resources and reduces environmental impact, showcasing a sustainable approach to managing fertiliser use effectively.

The use of technology on Maurizio Mazzeo's farm has a sustainable impact mainly in the management of fertilisers, reducing their use and maximising their effectiveness through georeferenced fertilisation. This makes it possible to optimise resources while reducing environmental impact. Although fungicide and herbicide treatments have recently been introduced, their effectiveness is still being evaluated. However, there is still uncertainty regarding weed killers, as current technology cannot accurately distinguish weeds from cultivated plants, limiting the optimal use of such treatments.

How this is Inspirational for others

The Azienda Agricola Palino case study is inspirational to other farmers because it demonstrates how advanced technologies can transform agriculture into a more sustainable and efficient practice.

Key inspirational aspects include:
Resource Optimisation: The use of georeferenced fertilisation and bi-directional communication with tractors ensures precise application of inputs, reducing waste and environmental impact.
Targeted Pest Management: DSS software and pheromone traps enable targeted pest control, reducing the need for widespread chemical applications and minimising ecological harm.
Smart Irrigation: Internet of Things (IoT) sensors monitor soil and leaf moisture, ensuring optimal water use and preventing resource wastage.
Data-Driven Decisions: Yield maps and real-time data collection allow farmers to make informed, precise decisions to improve productivity and sustainability.

USEFUL LINKS

- Website
- LinkedIn
- Vida-Rural Information

Fattoria Giuntoli

Type of technology used:

- ✓ Data- Analytics
- ✓ Sensors
- ✓ Internet-of-Things

Does the Practice relate to hardware, software or both?

- ✓ Hardware
- ✓ Software

Fattoria Giuntoli is a full-cycle cereal, fodder and agri-food company that produces and processes 0 km products.

Since 2009, the farm has been practicing Conservation Agriculture, a set of cultivation practices that are based on the utmost respect for the environment, the soil and biodiversity. The farm prides itself on being technologically advanced both in the cultivation of the land and in regards the highest level of animal welfare.

The company has been handed down from generation to generation for about a century and is now run by Anna and Santino Giuntoli, both agronomists. Initially, the farm focused on raising sheep that populated the marshy expanses of the valley. In the first decade of the 21st century, the farm began to take on the appearance of today's farm, with the opening of the farm shop and the reappearance of cattle and pig breeding, no longer for sheep but for cattle and pigs fed exclusively with products from the farm.

How is this technology being used?

Fattoria Giuntoli employs a variety of advanced technologies to enhance efficiency and sustainability in its agricultural practices:

These technologies enable the farm to increase productivity, minimise environmental impact, and manage resources more effectively, serving as a model for sustainable and technologically advanced farming…for example:

Decision Support Systems (DSS): uses mathematical models and collected data to guide agricultural decisions. It optimises the use of water and fertilisers, reducing waste and improving crop management.

Satellite Guidance Systems: Ensure high precision in field operations, reducing fuel consumption, costs, and emissions. It thus improves operational efficiency by enabling exact and resourceful fieldwork.

Fattoria Giuntoli

The Technology's Sustainable Impact

Fattoria Giuntoli integrates advanced technologies to enhance sustainability in its agricultural operations.

Fattoria Giuntoli's use of DSS systems and satellite guidance promotes agricultural sustainability by optimising the use of natural resources, such as water and fertilisers, while minimising waste. DSS enable more precise and data-driven management, limiting excess chemical inputs and improving long-term soil health. Satellite guidance ensures that every farming operation is carried out with precision, contributing to a reduction in fuel consumption and emissions. These technologies not only improve productivity, but also environmental efficiency.

How this is Inspirational for others

The Fattoria Giuntoli case study is inspirational to other farmers because it demonstrates how integrating advanced technology can balance productivity and sustainability

Fattoria Giuntoli's approach can inspire other farmers by demonstrating how the adoption of advanced technologies, such as DSS systems and satellite guidance, can improve both sustainability and profitability. These solutions enable more efficient management of resources, reducing operating costs and environmental impacts, while increasing productivity. The integration of innovative and data-driven practices can help other farmers optimise processes, reduce the use of chemical inputs and address the challenges of climate change, ensuring more sustainable production

USEFUL LINKS

- Website
- Facebook
- Twitter/X
- YouTube

Marcello Fiscante

Type of technology used:

- ✓ GPS
- ✓ Data Analytics

Does the Practice relate to hardware, software or both?

- ✓ Hardware
- ✓ Software

Mr. Marcello Fiscante's farm, which has been in operation for generations, specialises in the cultivation of Senatore Cappelli wheat.

This Wheat is an ancient variety with superior organoleptic properties and particularly suited to the local soil type. Despite a lower yield, it is ideal for those suffering from gluten intolerance. To cope with the wheat price crisis, Marcello has introduced sustainable practices by reducing soil tillage and the use of pesticides, focusing on more resistant local varieties such as Senatore Cappelli. He has also invested in advanced technologies, such as GPS and integrated farming, to reduce waste and environmental impact, in line with Agenda 2030.

How is this technology being used?

Marcello Fiscante's farm leverages GPS technology to enhance efficiency and sustainability in wheat cultivation

Marcello's approach integrates advanced technology with sustainable farming, optimising resources while preserving biodiversity and reducing environmental impact. He uses GPS to manage the fields, avoiding double fertilisation in some areas and lack of treatment in others. Thanks to GPS, operators cover the ground with precision and speed, ensuring that each area receives the correct treatment. In addition, the system makes it possible to store data on all operations carried out, map fields, reduce management costs and increase revenue. The application of GPS results in cost savings of around 10%, optimising farming practices and improving operational efficiency.

Marcello Fiscante

The Technology's Sustainable Impact

Marcello Fiscante's approach is sustainable due to its focus on reducing environmental impact and optimising resources through technology and traditional practices.

The use of fewer chemical inputs not only reduces immediate production costs but has a positive impact in the long term. Excess pesticides make pests more resistant, creating a vicious cycle that requires the use of more chemicals and increases costs for farmers. GPS contributes to agricultural sustainability by reducing the consumption of plant protection products, fertilisers and pesticides, lowering operating costs, increasing time savings and profitability. In addition, it allows you to operate at any time, thanks to the automated guidance of GPS.

How this is Inspirational for others

This approach can inspire other farmers by showing how the use of sustainable farming practices and advanced technologies can improve profitability and reduce environmental impact.

The adoption of hardier local wheat varieties and the use of GPS to optimise fertiliser and pesticide use demonstrate that it is possible to reduce costs and preserve biodiversity while maintaining high production standards. This model encourages farmers to invest in innovation and overcome economic challenges by adopting solutions that favour both efficiency and sustainability.

USEFUL LINKS

- More Information

Maurizio Mazzeo

Type of technology used:

- ✓ GPS
- ✓ Data Analytics
- ✓ Automation
- ✓ Sensors

Does the Practice relate to hardware, software or both?

- ✓ Hardware
- ✓ Software

Maurizio Mazzeo's farm is located in Sant'Agata di Puglia and covers around 150 hectares.

The main activity is the cultivation of cereals, especially wheat, with other crops used in rotation to ensure soil fertility and agronomic sustainability. Mazzeo adopts innovative farming practices that combine tradition and technology, focusing on cultivation methods with a low environmental impact. Thanks to precision farming techniques and the use of new technologies, such as irrigation and soil monitoring systems, the company aims to optimise the use of resources and reduce environmental impact, while maintaining high standards of productivity.

How is this technology being used?

Maurizio Mazzeo's farm uses a range of advanced technologies to optimise operations and improve productivity.

The farm vehicles are equipped with GPS and autonomous driving systems, supported by ISOBAS technology for trailer management. Fertilisation is georeferenced and managed through prescription maps loaded on computers that communicate bi-directionally with the tractor. For more than a year, DSS software has been used to determine when and how to intervene, e.g. for pathogen control.

Pheromone traps and digital sensors make it possible to monitor the olive grove without the need for manual inspections. Harvesters are equipped with sensors to create yield maps, which provide timely harvest data. Among the software used are Tribol, XFARM for farm management, and Fieldview by BYern for yield map analysis.

Maurizio Mazzeo

The Technology's Sustainable Impact

Maurizio's approach is sustainable due to its focus on reducing environmental impact and optimising resources through technology.

The use of technology on Maurizio Mazzeo's farm has a sustainable impact mainly in the management of fertilisers, reducing their use and maximising their effectiveness through georeferenced fertilisation. This makes it possible to optimise resources while reducing environmental impact. Although fungicide and herbicide treatments have recently been introduced, their effectiveness is still being evaluated. However, there is still uncertainty regarding weed killers, as current technology cannot accurately distinguish weeds from cultivated plants, limiting the optimal use of such treatments.

How this is Inspirational for others

Maurizio Mazzeo's approach can inspire other farmers by showing the benefit of adopting advanced technologies, such as geo-referenced fertilisation and DSS systems.

These technologies can reduce resource use and improve efficiency, contributing to more sustainable agricultural management. However, for small farms of around 50 hectares, investment in such technologies may not be worthwhile without the right financial support. Training is crucial to make the most of these innovations: knowing how to use and integrate these technologies is essential to maximise benefits and reduce environmental impact

USEFUL LINKS

- More Information

Olio Monte Fedele

Type of technology used:

✓ BlockChain

Does the Practice relate to hardware, software or both?

✓ Software

Olio Monte Fedele is a historic company located in Bovino, in the province of Foggia, specialising in the production of high quality extra virgin olive oil.

The company combines tradition and innovation, focusing on a product obtained from centuries-old olive trees and sustainable cultivation techniques. A distinctive element is the use of blockchain technology to trace the entire production chain, guaranteeing transparency and certification of origin and processes. This solution allows consumers to verify every stage of production, from harvesting to pressing and distribution, ensuring an authentic and traceable product

How is this technology being used?

Olio Monte Fedele uses blockchain technology to track the entire production process of its extra virgin olive oil.

Each stage of the supply chain, from olive harvesting to processing and packaging, is securely and immutably recorded on a blockchain platform. This guarantees transparency, authenticity and quality, allowing consumers to verify detailed information such as the origin of the olives, cultivation methods, and extraction processes. The blockchain ensures that no stage is altered or manipulated, offering trust and security to the end consumer.

Olio Monte Fedele

The Technology's Sustainable Impact

By using blockchain, Olio Monte Fedele is creating a replicable model for transparent, responsible, and sustainable agricultural management.

Blockchain technology helps the agricultural sector, especially small oil producers such as Olio Monte Fedele, to counteract the problem of counterfeiting, which damages the reputation and market of authentic products. The complete traceability of the production chain reassures consumers about the origin and quality of the product, reducing mistrust caused by fraudulent practices. This fosters greater confidence in the oil market, encouraging informed purchases and rewarding producers who follow sustainable and transparent practices. As a result, responsible farming practices and reduced environmental impact are promoted.

How this is Inspirational for others

Olio Monte Fedele's approach can inspire other farmers by demonstrating how the adoption of innovative technologies such as blockchain can have beneficial outcomes.

Innovative technologies such as blockchain can protect small-scale producers against counterfeiting, ensure transparency, and increase consumer trust. Tracking each stage of production allows the quality and authenticity of the product to be enhanced, improving competitiveness in the market.

Furthermore, the adoption of sustainable practices, combined with the use of advanced technologies, encourages more efficient and environmentally friendly management, offering a replicable model for improving agricultural sustainability.

USEFUL LINKS

- Website
  Facebook
- Instagram
- YouTube

EUROPEAN

Plantivet

Type of technology used:

- ✓ Internet-of-Things
- ✓ Big-data analytics
- ✓ Smart Sensors

Does the Practice relate to hardware, software or both?

- ✓ Hardware
- ✓ Software

Plantivet, founded in 2009 by the Pateiro da Silva family from Reguengos de Monsaraz, specialises in wine cultivation and multiplication of vine varieties and clones.

It operates in Mother Vineyards, producing vegetative propagation material. In 2010, Plantivet partnered with Vivai Cooperativi Rauscedo - VCR, the world's largest winegrowers, to use VCR's advanced plant multiplication technology to provide high-quality plants to Portuguese winegrowers.

The family farm, passed down through generations, prioritises sustainability and heritage maintenance. The farm's long-term strategy is an endurance race, aiming to pass on the heritage from generation to generation.

How is this technology being used?

This innovation and technology helps agriculture manage climatic change.

In 2022, the farm installed a weather station on their main farm, allowing them to manage their water usage. They use probes to measure humidity content and use software to identify areas needing more water. This innovation and technology helps agriculture manage climatic change. Reguengos also has an "Alqueva" (dam) tool, which is close to the farm and allows for an increase in production efficiency. The Alqueva dam is a fundamental pillar in managing farms in the Alentejo region, enabling the growth of permanent crops like vines, olive groves, and almonds. This stimulates production, keeps people employed, and boosts the economy.

Plantivet

The Technology's Sustainable Impact

Since January 2021, Plantivet and Quinta do Vale have transitioned to biological production mode, eliminating the use of herbicides, pesticides, and synthetic fertilisers.

Instead, they use regenerative agriculture practices, minimal soil mobilisation, and promote biodiversity and soil microbiology. The farm is holistic, integrating the main crop into a bio-diverse agro-silvo-pastoral system. Analytics, humidity control probes, and a meteorological station are used to support operations, reduce fuel and fertiliser consumption, and optimise resource use. Around 60% of the farm's energy comes from renewable sources, including photovoltaic panels installed in all production units, to minimise environmental impact.

Climate change is causing severe damage to agricultural production, with events such as extreme weather, short rain periods, and long drought periods. This has led to a short vine cycle and exposure to late frosts, making agricultural management difficult.

Plantivet see agriculture, especially viticulture and the wine sector, as a force for preserving the environment, strengthening the economy and reversing the trend of desertification in rural areas.

How this is Inspirational for others

Quinta do Vale and the Plantivet company is an inspiration for other farmers in areas that struggle with little water resources and drought, not only in viticulture.

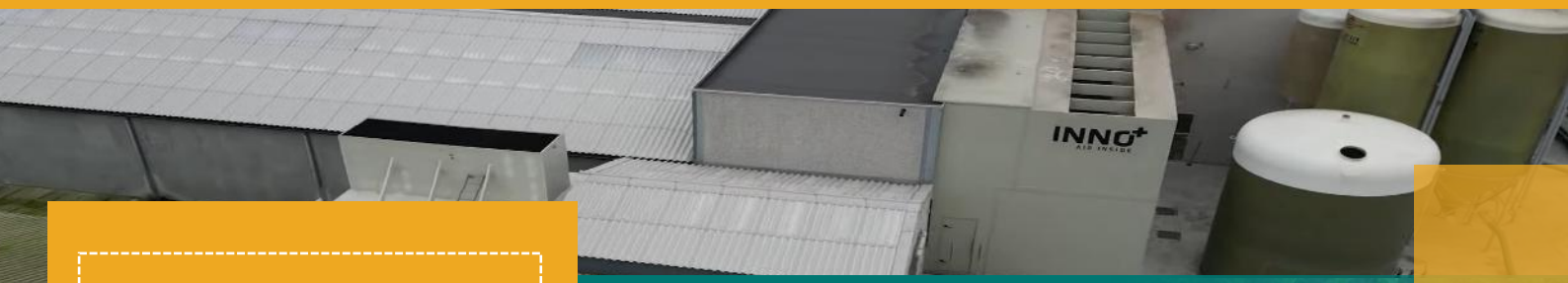
They show a way to counteract those climate changes and build a sustainable system that is completely in their control through sensors and real-time information collected by software from the wireless sensor network.

On the other hand, they are an inspiration regarding a social aspect. Quinta do Vale is establishing a community for food production, involving all employees to supply basic foodstuffs throughout the year. The aim is not only to provide healthy, nutritious food at representative costs but also to foster interaction between families

USEFUL LINKS

- Website
- LinkedIn
- Vida-Rural Information

Brasvar Pig Farm



Type of technology used:

- ✓ Air-Scrubbers
- ✓ Manure separators

Does the Practice relate to hardware, software or both?

- ✓ Hardware

The Brasvar pig farm is a family business that has been passed on for four generations at Nevele, in the province of East Flanders, Belgium.

There are 650 sows that Brasvar houses, where all the young piglets are born. They work with them from piglets until they are fully grown and ready to go to the slaughterhouse. The pig farm has been improved and revolutionized via new technologies throughout the years in order to provide a guarantee of quality, original and traditional taste as well as caring for animal welfare.

How is this technology being used?

On Brasvar farm they have implemented four technological elements to improve its pig barns.

The first is the separation of manure under the pigs, using a system to separate thin and thick fractions to prevent ammonia release.
The second is the use of air scrubbers, which filter air through a biofilter and wash package, removing ammonia, odour, and particulate matter. The air is then pushed through the package, resulting in a clean, odourless environment.
The third element is the installation of soil panels and finally, they practice rainwater collection. These innovative measures aim to reduce the amount of ammonia released in the barns.

Brasvar Pig Farm

The Technology's Sustainable Impact

The Brasvar Farm cares about the environment and represents an innovative circular approach.

Firstly, their animal feed is from their own maize cultivation as well as local waste streams. Their animal manure helps this maize to mature. The remaining manure is used to generate energy, and they use solar panels on the roofs and to generate green electricity. In addition, rainwater is collected and reused to clean the stables. Before leaving the stables, the air is cleaned of dust, odours and ammonia.

The company is reducing over 80% of its emissions from outside sources, focusing on sustainability. They use wet feed and traditional "Bras" nutrition for their quality label, sourcing high-quality protein, carbohydrates, and starch from local sources like a Gin distillery and potato steam peels from Deinze. These products are diluted with long grain, wheat, and barley to create "Bras" nutrition, which is then given to the pigs. The company also stores six different products in silos, ensuring they provide the pigs with the necessary nutrients to maintain their health. Altogether this approach aims to minimise emissions and promote sustainability in the pig industry.

How this is Inspirational for others

This circular approach is an inspiration for other farmers because it takes into account sustainability at every stage of breeding and transport.

Another characteristic of their work is that caring for an animal is more than a taste of the past. Innovative and sustainable measures that treat animals and the environment with respect have a huge impact. There is no mass production at BRASVAR, but the care of each animal at every stage of breeding and all the way to the end customer.

USEFUL LINKS

- Website
- Facebook
- Youtube

Hofgut Duelli

Type of technology used:

- ✓ Smart Sensors
- ✓ BioGas Plant
- ✓ Agri-PV

Does the Practice relate to hardware, software or both?

- ✓ Hardware

Hofgut Duelli is a farm in Willhelmsdorf, Germany that has owned a biogas plant since 2005

Hofgut Duelli produces electricity and heat on-site with renewable resources and the heat is also supplied to local households within the community. A biogas upgrading plant has also recently been installed there, thanks to which CNG is produced from the biogas.
The owner Philipp Duelli offers his customers traditional cuisine with regional beef. The young farmer is full of ideas. He doesn't just farm and run a biogas plant. He has specialized in keeping suckler cows and fattening young animals. Thanks to grazing and his constant commitment to the welfare of his animals, he is able to offer his customers high-quality beef. He markets the meat directly to private customers and restaurants. The young farmer has also come up with something very special for his customers: He processes some of the meat into finished products and sells them in cans.

How is this technology being used?

Hofgut Duelli uses various technologies in various beneficial and commercially viable ways.

For instance, some of the biogas is converted into CNG and used to power the farm's equipment. Since 2005, the biogas plant has generated power and heat, which is then utilized by the community and farm to heat various residences and communal structures.
A certain amount of the biogas produced is captured and treated. It is purified, since biogas typically includes 55-60% methane. CNG requires 97% methane.

Future plans involve the building of a barn for cows, which Phillip will equip with a photovoltaic system and an Agri-PV system next to it. Agri-PV is about building a photovoltaic system in an area. You have to put the photovoltaics a little higher so that the cattle can graze underneath, as before. It's a way of combining renewable energy with food production.

Hofgut Duelli

The Technology's Sustainable Impact

Hofgut Düelli exemplifies sustainable agriculture through the integration of advanced technologies and renewable energy systems.

The farm utilises a biogas facility that processes organic waste, such as animal manure and crop residues, through anaerobic digestion. This process produces biogas, a renewable energy source composed mainly of methane, which can be used for heating, electricity generation, or as a vehicle fuel. The digestion process also yields digestate, a nutrient-rich byproduct that serves as an organic fertiliser, enhancing soil health and reducing reliance on chemical fertilizers.

By implementing this biogas system, Hofgut Düelli effectively reduces greenhouse gas emissions, manages waste sustainably, and contributes to a circular economy.

How this is Inspirational for others

The farm's approach demonstrates how integrating renewable energy technologies into agricultural practices can lead to environmental and economic benefits for farmers seeking sustainable solutions.

Hofgut Düelli is a model of sustainable agriculture, focusing on organic farming, biodiversity, and community connections. The biogas facility at Hofgut Dülli serves as an inspirational model by showcasing how farms can turn waste into a valuable resource. It demonstrates that agricultural byproducts like manure and crop residues can be repurposed into renewable energy (biogas) and nutrient-rich organic fertilisers (digestate), fostering a circular economy. Their multifaceted approach strengthens ties between consumers, community, and agriculture while prioritising environmental stewardship.

By combining environmental benefits with economic advantages, the biogas facility offers a replicable model for farms worldwide, inspiring the adoption of renewable energy and sustainable waste practices.

USEFUL LINKS

- Website
- Facebook
- Instagram

Anttila Tattar

Type of technology used:

- ✓ Machine Learning
- ✓ Robotics & Automation

Does the Practice relate to hardware, software or both?

- ✓ Software

Since 2014, Tapio, the 13th generation owner of Anttila Tattar farm in Myrskylä, Finland has been running an organic farm.

The farm, which has grown winter wheat, spring wheat, oats, and grass since 1995, became 400 years old in 2022. The farm combines forestry and agriculture, with Tapio introducing innovation and modernising forestry methods. The farm's long, cold winters in Finland make it difficult to engage in agriculture, but they prepare for the next season by planning machines and working in advance. The farm's 400-year-old history and Tapio's commitment to innovation have made it a successful and sustainable company.

How is this technology being used?

Precision machinery is used to minimise trampling in forests, requiring automatic steering and rate control.

Anttila's autopilot has an accuracy of plus/minus two centimetres. Modern forest cutting involves big machines, with one man handling all tasks. The machines measure trees and suggest appropriate cutting methods, while the driver ensures quality. The forest owner receives their wood pile, and the buyer receives their part of the pile. 70% of branches are collected for energy production, heating houses, and creating biodiversity. When thinning the forest, branches are left on the ground to protect tree roots and fertilise the forest. The remaining branches are collected during regeneration felling for energy production. The traditional method of planting, sawing, carrying, and measuring trees in the 60s and 70s involved handwork, while modern machines are more intelligent and efficient.

Anttila Tattar

The Technology's Sustainable Impact

This Finnish forestry case study demonstrates a significant impact on sustainability through the integration of modern technology and biodiversity-focused practices.

In Finland, it takes around 80 years for a forest to be ready for harvesting, requiring extensive management. The first 20 years of a forest owner often don't yield profit, but they leave some trees growing, such as during regenerative felling, to create biodiversity for the future. This sustainable approach benefits both the economy and nature. Forest owner Tapio cares for biodiversity and adheres to Finnish certifications like PEF and FSC. They protect voluntarily 5% of the total area, leaving another 5% untouched. This approach not only makes forests a carbon sink but also a sustainable source of raw materials, allowing for the replacement of fossil products and the use of all lumber from the forest. This sustainable approach is sustainable for both the economy and nature

How this is Inspirational for others

Anttila Tattar serves as a blueprint for sustainable forest management, proving that advanced technology and eco-friendly practices can align to ensure the longevity and health of natural resources.

Key inspirational aspects include:
Precision Technology Integration: The use of advanced machinery with autopilot systems ensures efficiency and environmental protection, inspiring others to adopt similar technology for minimal ecological disruption.
Biodiversity Preservation: By leaving 10% of the forest untouched and practicing regenerative felling, the approach highlights how forestry can actively contribute to biodiversity and ecological balance.
Renewable Energy Production: Using branches and forestry byproducts for energy production demonstrates how waste can be transformed into a valuable resource, showcasing the circular economy in action.
Commitment to Long-Term Sustainability: The focus on certifications like PEF and FSC, and the care for forests as carbon sinks, inspire a long-term vision for balancing economic and environmental goals.

USEFUL LINKS

- Further Information
- SoilFood case study
- Interesting Article

GAEC Dairy Farm

Type of technology used:

- ✓ Smart Sensors
- ✓ Robotics & Automation

Does the Practice relate to hardware, software or both?

- ✓ Software
- ✓ Hardware

The collective GAEC was founded almost 50 years ago in 1986, in the Bas-Rhin region of Alsace, France.

It started with a family farm led by a father and his daughter. However, now it is an agricultural cooperative for joint exploitation that operates with multiple farmers. Initially, there were 45 dairy cow farms with an annual milk production of 200,000 liters. Today, there are nine people working on a farm with 310 cows and over 3 million liters of milk. GAEC facilitates generational renewal, retirement with dignity, and vacations. With a large number of partners and one employee, it is a large cooperative, making it feasible to operate farms smaller than individual farms

How is this technology being used?

Two main forms of technology are being utilised within this cooperative and are proving to be hugely beneficial.

Firstly there is an **automated milking system,** which is a major innovation. Each of the four robots has its respective batch of cows. When they want to, they are milked. Depending on the amount of milk they have, they are qualified for milking. Each milking includes a milk test. The robot informs the farmer of abnormalities in the quality of the milk.

They implement a **methanisation process** that produces electricity, which is the basis of the second technology. Meadows are carbon collectors that is being stored and used. Intercropping, cipan and green manures reduce greenhouse gas emissions and have a positive impact on the environment. It is all controlled and monitored through the use of sensors and smart storage techniques

GAEC Dairy Farm

The Technology's Sustainable Impact

This cooperative farm is implementing several technologies that are having a noteworthy sustainable impact.

The milking system, though slightly more costly, saves space by requiring smaller facilities, leading to long-term savings. Also, because the milking is done automatically, the farmer has more time to focus on animal care, reducing labour costs.

The CAP'2ER process, which includes the GAEC farm, is another important element. This study is carried out on the farm at a specific time to assess the environmental impact of the farm. It shows that grasslands and meadows have a positive impact because they are carbon collectors. The farm's use of green manures, intercrops, and cipan significantly benefits the environment.

On their farm, greenhouse gas emissions, especially methane, mainly from slurry pits, were the biggest problem. Methanisation, converting manure into electricity, addresses methane emissions, solving both agricultural and energy challenges with dual environmental benefits.

How this is Inspirational for others

This case study inspires farmers by proving that technology and cooperative frameworks can enhance productivity, reduce environmental impact, and improve animal welfare while maintaining economic viability

Key inspirational aspects include:

Automation for Efficiency and Welfare: Automated milking robots allow cows to choose their milking times, improving animal welfare and milk quality. Additional features, like cow brushes for self-massage and automated hoof-cleaning systems, ensure animal health and comfort, reducing infections and enhancing productivity.

Methanisation and Renewable Energy: The farm converts manure into electricity through methanisation, tackling methane emissions and turning waste into a valuable resource. This process aligns with the EU's carbon farming goals, inspiring other farmers to adopt practices that reduce greenhouse gas emissions.

Carbon Sequestration: The use of green manures, intercrops, and meadows as carbon collectors demonstrates how to integrate environmental stewardship into farming. The CAP'2ER process evaluates the farm's environmental impact, promoting accountability and measurable sustainability.

Cooperative Model for Generational Renewal: By operating as a cooperative, the GAEC farm supports shared responsibilities, enabling generational renewal and creating a more sustainable and collaborative farming model.

USEFUL LINKS

- Further Information
- Facebook
- YouTube

04

Conclusion

Poland

Sustainable agriculture in **Poland** is being advanced through the implementation of various good practices by key players in the industry. Hodowla Roślin Smolice is making significant strides in breeding modern varieties of agricultural plants and producing high-quality seeds, which are valued not only in Poland but also in neighboring countries. Their investment in modern, precise equipment demonstrates a commitment to sustainable production technologies.

The TopFarms Group, operating on over 30 thousand hectares, is leading the way in innovation, crop optimization, and regenerative agriculture. Their collaboration with agricultural universities to facilitate internships for aspiring agricultural professionals further underlines their commitment to knowledge exchange and skill development in the sector.

IHAR Experimental Plant's use of unmanned aerial vehicles for crop monitoring and disease prevention showcases a forward-thinking approach to sustainable farming practices. By leveraging technology to detect hunting damage and conduct aerial inspections of soil and plant health, they are ensuring a more efficient and sustainable use of resources while maximizing yield.

Furthermore, Grzegorz Bardowski's farm is embracing environmentally friendly solutions, such as the ISARIA sensor and CROP SENSOR, to optimize chemical input and enhance yield quality.

Lastly, Top Agrar Polska, managed by Tomacz Czubiński, a young, part-time farmer, is integrating budget-conscious technology to enable precise weed identification and selection of effective herbicides, promoting sustainable crop management.

These initiatives collectively demonstrate a commitment to sustainable agriculture, offering inspiration and practical solutions for farmers across Poland and beyond.

Czech Republic

After research carried out by our Czech partner (CZU), we can say that all the selected case studies indicate commendable practices from **the Czech Republic.** These farms are dedicated to increasing the efficiency of agricultural work, lowering costs, and reducing environmental impact. They process data and make decisions using advanced technologies such as sensor data collection, weather monitoring stations, and complex digital systems.

VESA Velhartice a.s. specializes in potato management, whereas Mlyn Podhora Farm focuses on technological innovations in vegetable management. Meanwhile, Vospol stands out with its fully automated livestock production system, which exemplifies a comprehensive approach to sustainable agriculture. Overall, these farms demonstrate innovative and sustainable farming practices, setting a good example for the industry.

Ireland

Among other Best Practices, Emerald Greens' example has changed the landscape of agriculture in **Ireland** with its cutting-edge vertical farming initiative, setting a benchmark for farming in a controlled environment. Using advanced hydroponic systems and LED lighting, the company has achieved unparalleled efficiencies in crop production, providing fresher, tastier and pesticide-free crops all year round. What's more, their sustainable practices, including wind and solar power generation, exemplify their commitment to reducing their environmental impact and promoting local, environmentally friendly products. Similarly, Treemetrics, with its IoT technology 'Internet of Trees', is transforming traditional forestry methods by offering a comprehensive solution for sustainable forest management. Their platform enables users to optimise resource use and increase the potential of forests, in line with Ireland's climate action targets. Cotter Agritech Ltd's innovative sheep handling system and SmartWorm app not only improves livestock management but also contributes to sustainable agriculture by reducing chemical inputs and improving animal welfare. In addition, Herdwatch's digital platform simplifies farm management, promoting sustainability through efficient resource use and streamlined agricultural compliance. Finally, the National Genotyping Programme drives genetic improvement in Irish cattle breeding, supporting environmentally friendly breeding practices and aligning with Irish climate targets. Together, these pioneering initiatives demonstrate how technology and innovation are transforming farming practices in Ireland, setting a precedent for sustainable and efficient agriculture worldwide.

Slovakia

All good practices presented from **Slovakia** serve as an inspiration for farmers. Gamota's commitment to growing non-GM soya and data-driven irrigation is in line with consumer demand for healthy, sustainable products. Agricon's precision farming tools and data-driven decision-making enable farmers to optimise resource use and improve yields. Kopek Bakery's technology exemplifies the principles of a circular economy, transforming food waste into valuable by-products. TBS, a.s.'s integration of organic livestock farming with tourism and non-thermal processing technologies sets a high standard for sustainable food production. Vibavi's use of drones for crop monitoring and management increases productivity and promotes sustainable farming practices. Together, these innovative practices demonstrate the potential of advanced tools and strategies to improve farm sustainability.

Italy

The Italian examples presented illustrate effective practices in smart, sustainable agriculture, showcasing a variety of innovative approaches.
Azienda Agricola Palino's commitment to sustainable agriculture is evident through its use of crop rotation techniques, advanced technologies, and georeferenced fertilisation. This approach serves as a model for improving production efficiency while reducing resource use and environmental impact.
Fattoria Giuntoli's adoption of Decision Support Systems (DSS) and satellite guidance not only promotes agricultural sustainability but also optimises natural resource usage, limits chemical inputs, and enhances operational efficiency.
Marcello Fiscante's farm demonstrates the potential of integrating advanced technology with sustainable farming, including the use of GPS and hardier local wheat varieties. This showcases the possibility of reducing costs, preserving biodiversity, and maintaining high production standards.
Maurizio Mazzeo's farm showcases the sustainable impact of precision farming techniques, georeferenced fertilisation, and the use of new technologies to optimize resource use and reduce environmental impact.
Olio Monte Fedele's innovative use of blockchain technology to trace the entire production chain sets a standard for ensuring transparency, authenticity, and quality, countering counterfeiting, and promoting responsible farming practices and reduced environmental impact.

These exemplary approaches collectively illustrate how the adoption of advanced technologies, sustainable practices, and transparent processes can contribute to more efficient and environmentally friendly agricultural management in Italy.

European

The best practices from across **Europe** show smart and sustainable agriculture. Plantivet in **Portugal** stands out for its commitment to sustainability and heritage conservation, which is achieved through the use of advanced plant propagation technology and weather management innovations. The **Belgian** pig farm Brasvar sets an example by focusing on reducing emissions, utilising renewable energy sources, and prioritising animal welfare. Hofgut Duelli in **Germany** exemplifies a multifaceted approach to sustainability by combining renewable energy production, organic farming, and community connections.

Anttila Tattar from **Finland** impresses with its precise integration of technology, biodiversity conservation, and renewable energy generation from forest byproducts. As an example of cooperative farming in **France**, the GAEC dairy farm illustrates automation to improve productivity and welfare, methanisation for renewable energy, and carbon sequestration practices.
All these initiatives work together to inspire sustainable farming practices while also demonstrating the potential for environmental stewardship and profitability in the agricultural sector.

05

Meet The Team

MEET THE TEAM

Instytut Hodowli i Aklimatyzacji Roślin

Team Lead: *Dr. Agnieszka Rachwalska, a seasoned trainer and expert in biological and agricultural sciences.*

The lead coordinator for Smart Skills, IHAR's Experimental Department at Grodkowice specialises in plant breeding and the implementation of innovative agricultural practices. With a focus on developing training for farmers, educators, and students, IHAR's hands-on approach to plant production and agronomic methods is a core asset to our project.

IHAR oversees project management and reporting and ensures that Smart Skills stays aligned with its goals in sustainable agriculture.

Momentum Marketing Services

Key Contributors: *Orla Casey, Managing Director, and Paula Whyte, Agri-Food Sector Lead.*

Momentum brings its expertise in developing progressive learning programmes, particularly in sustainability and digital skills for adult and further education. Known for its strong marketing and dissemination capabilities, Momentum is instrumental in creating and managing the Smart Skills brand and communications strategy. Their role extends to sharing project results with a wider audience to ensure impactful dissemination.

ARID Association

Notable Team Members: *Maciej Dymacz, Chairman, and Natalia Kobiernik, Project Manager, both experienced in rural innovation and digital skills training.*

Founded to support rural development and lifelong learning, ARID promotes innovation and digital transformation in agriculture. They bring rich experience from past projects in sustainable agriculture and precision farming. Within Smart Skills, ARID contributes to Work Package 2, developing the Good Practice Guide, and supporting overall content development and translation for accessibility.

MEET THE TEAM

New Edu

Lead Experts: *Zuzana Palkova and Marieta Okenková, with extensive experience in agricultural policy and rural development.*

New Edu combines research with hands-on training in the agriculture and food sectors, working closely with academic institutions and local governments to strengthen rural communities. For Smart Skills, New Edu leads content development for learning modules on topics such as digital farming and automated control systems. Their efforts include designing a comprehensive template to standardise the module structure.

Meridaunia Local Action Group

Key Members: *Daniele Borrelli, Director, and Angela Maria Loporchio, Project Manager, both leaders in European funding and sustainable rural initiatives.*

Meridaunia, a consortium representing 30 municipalities in the Monti Dauni area, is committed to local development and sustainable practices. With experience in community-driven projects, Meridaunia supports content creation and visual resources for learning modules, helping rural farmers and communities embrace digital tools and sustainable farming methods.

MEET THE TEAM

Czech University of Life Sciences

Featured Researchers: *Pavel Šimek and Eva Kanska, experts in data analysis, ICT, and precision farming.*

With a strong foundation in precision agriculture and digital technologies, CZU's Faculty of Economics and Management provides key insights and tools for Smart Skills. CZU is preparing to host the upcoming transnational project meeting and contributes to Work Package 2 by sharing best practices and developing a literature review to guide module topics.

European E-learning Institute

Core Team: *Canice Hamill, Instructional Designer, and Kathy Kelly, Head of Diversity and Inclusion, who focus on inclusive and innovative e-learning solutions.*

EUEI leads in digital education, specialising in interactive and inclusive e-learning experiences. Their expertise supports the development of the digital learning platform for Smart Skills, including hosting the final Good Practice Guide and ensuring accessibility across all resources. EUEI is also managing the project's social media presence and website to increase visibility.


“A LITTLE PROGRESS EACH DAY ADDS UP TO BIG RESULTS”
- Satya

smart skills

smart sustainable agriculture

www.smartskillsproject.eu

Follow our journey

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them. 2023-2-PL01-KA220-VET-000178755