FARM MANAGEMENT SYSTEMS

A GUIDE TO FARMER'S SOLUTIONS

AGRO HUB

TOP LEAD

Content

One of Agrohub's priorities is to help farmers improve efficiency of their production at every stage. It is a complicated and complex task that starts with full, high-quality information sourcing, and the use of the best practices and approaches available.

The implementation of FMS is a real game-changer. These systems allow you to automate many operational processes from land bank management and work planning to monitoring and logistics. Besides, the variety of products on the market makes it possible to choose a solution that is most suitable for the scale and characteristics of the enterprise. However, while analyzing the use of FMS at various agricultural enterprises, we noticed that some of their functions and capabilities are not used to their full potential, and some remain completely neglected.

Guided by the mission to undergo with the farmer the whole process, starting from audit and interview to the choice of technological solutions that will increase profit and production efficiency, we have created another product. In addition to Innovation Agenda and Benchmarking, we developed Farm Management System Guide — an in-depth, yet comprehensible overview of all existing farm management systems.

We offer a detailed comparative description of each system in the following areas: planning, monitoring, economics, automation, logistics, and sales. All information in the guide is systematized according to a single principle, which makes it easy to research, compare, and choose the most suitable system among all the offers on the market.

Our guide includes information about the available and the most relevant FMS for Eastern Europe. We are sure that it will be useful not only for those farmers who are just choosing a farm management solution but also for those who are already actively using its advantages. You may learn something new about the FMS product that you have already implemented in your enterprise!

If your solution is not in this guide, please email us: start@agrohub.org

Yulia Poroshenko,
Agrohub founder

One of the main problems of agricultural producers in Ukraine is ineffective business management. There are many reasons for this, but there is only one solution — the implementation of innovative digital technologies. It is such solutions that will help digital farmers increase the efficiency of agribusiness by simplifying processes, converting them into digital format, and providing the analysis based on big data. Farm management systems are one of those tools that will help you solve these problems.

Digital transformation has become the catchphrase of the year in Ukraine. There are clear benefits to using and analyzing data. But what should the farmer start digitalization from? How to choose the necessary product? Only our guide contains an overview of two dozen platforms. Every year new solutions appear, and existing ones are constantly improving. Therefore, Top Lead together with Agrohub, launched an annual study of farm management systems. AgFunder, the internationally acclaimed investment fund, which also issues reports, has become our partner.

The first issue of our Guide to Farm Management Systems is a product, the main goal of which is to help farmers take the first steps in increasing their efficiency and choosing the most suitable solution from a variety of platforms. To this end, we want to take on the role of a mediator who will help find a common language between solution manufacturers and those who will implement these solutions in their company.

In our guide, we have segmented solutions according to their capacity in the current year. We know that solutions will be improved, changed, and will become more functional. However, at this stage, we give basic information on the current capacities of the systems. We also provide basic information on prices, availability of a mobile application, and other features.

We will annually update the Guide, refreshing and adding the information both on the solutions that have been already included and on those that may appear after the release of our guide. Besides, we will regularly prepare reviews of new product features. These materials will be regularly posted on aggeek.net.

Stanislav Shum,
CEO Top Lead

We are delighted to be involved with the Guide to Farm Management Systems. The development and adoption of innovative digital technologies to assist farmers with all aspects of their operations will be crucial in increasing farm productivity and incomes, whilst contributing to the reduction in global greenhouse gas emissions.

AgFunder is a venture capital firm investing in agrifood technology startups across the world. What makes AgFunder unique from other venture capital firms is its use of technology and media to drive a global ecosystem and proprietary technology developed in-house to help with the investment process.

We have built the largest community of investors, innovators, and key industry members in the world and have over 85,000 members and subscribers who receive our weekly newsletter and source our research. This community comes from top companies in food, agriculture, technology, and finance and is a key source for deal flow, expertise, investors, and information.

As one of the world's most active investors in agrifood technologies, we recognise the importance of investment to stimulate entrepreneurship and innovation in the farm sector. In Europe during 2019, Agrifood technology posted record-breaking levels of investment in startups at $3.4bn with dollar investment in Farm Management Software & IoT reaching $108m.

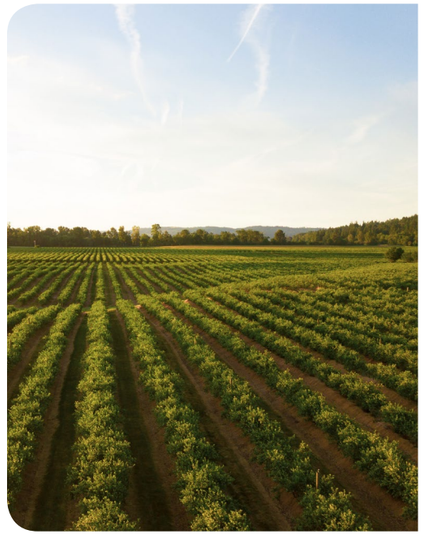
In 2020, despite a year of upheaval and uncertainty, funding levels for the agrifood tech sector globally has been relatively strong, with over $10.1bn invested by mid-year 2020. We expect to see the flow of investment capital into agrifood tech continue and encourage the farmers of Europe to explore the technologies available and the potential benefits it can bring.

Michael Dean,
AgFunder

Introduction. What is FMS?

Nowadays, agriculture is gradually transforming from a traditional business into an innovative industry. Every day, the farmer spends more time on a tablet or laptop than in the field. And companies view agriculture as a commercial enterprise rather than an activity of producing food for domestic consumption. Like any other business, agriculture also faces challenges such as limited resources. The integration of advanced technologies is an opportunity to increase your productivity and overcome limitations in the efficiency of capital use.

One of such solutions is farm management software that helps farmers easily track all operational activities and make optimal decisions based on an in-depth analysis of farm management.



Introduction and development of FMS

The introduction of FMS in agriculture occurred by searching for opportunities to move from accounting systems, for example, 1C, to a potential system capable of consolidating information in one place, processing data to obtain analytics, automating operational processes, and remotely controlling an enterprise.

The pioneers in the use of FMS were large agricultural enterprises that needed a solution that could facilitate the monitoring and management of vast land areas and hundreds of workers. The first FMS was an accounting system for enterprises, ERP, with functions customized for the needs of agricultural producers.

For example, 1C Agribusiness or SAP Agriculture. Later on, each company refined and tried to create a system for its needs. One of the difficulties of such solution is the high cost of development and the need to create a strong IT team.

With improving technology access, ready-to-use FMS such as Agrivi, Cropio or Soft. Farm began to emerge on the market. Thus, small and medium-sized agricultural enterprises, as well as commercial agricultural producers, got the opportunity to increase the efficiency of their production by optimizing agricultural processes. The difference lies in feature set: small businesses mainly need access to modern analytics functionality, such as satellite imagery or crop control; while cost control, inventory control, and resource efficiency are important for large businesses. Also, according to the integration model, FMS is segmented into a web interface, cloud subsystems. Implementation of cloud solutions is more popular among small farms because it can reduce the cost of managing and purchasing servers, software licensing, backups, and security. Meanwhile, large manufacturers pay considerable attention to data security and prefer to use closed systems with a web interface.

Today, the global FMS market is estimated to be $ 1.21 billion and is expected to have a CAGR of 13.2% in the forecast period until 2026.

Benefits for farmers and agribusiness managers

Effective farm management, in many ways, is analogous to management processes in any type of business, where many important decisions are required on a daily basis. FMS helps to improve production and crop profit rates by providing access to certain crops, environmental, and financial analytics.

The feature set of the most FMS helps to automate majority of the daily tasks for the management of the agricultural enterprise and the field manager. An important element is a coordination of all participants in the production process and effective communication.

The classic FMS model can include management blocks in the following areas:

- Land bank management and field mapping.
- Planning of production tasks, defining of production technologies.
- Monitoring and analysis of completed work in real-time mode.
- Monitoring of crops, agricultural scouting (ground and satellite data).
- Production economics: cost accrual, stock recording, and procurements.
- Automatic recording of transactions and automation of workflow.
- Logistics and grain control, from harvest to elevator.
- Sales and marketing.

The manager gets access to information on each area, which was hidden before. Using data properly, the agricultural manager is able to reduce the risk of production failure and allocate his resources more efficiently to achieve maximum potential. In quantitative terms, the approximate potential from the implementation of FMS is up to 30% growth of the production profitability due to the adoption of optimized decisions on operations during the season. Also, a positive economic effect is achieved by increasing control over production and isolating the risks of theft, unauthorized or incorrect work of personnel and equipment.

Land bank management

The main asset of each agricultural enterprise is land: lease agreements are concluded, the cadastral area is calculated, property rights are documented, and soil properties are analyzed. The main tasks of managing a land bank fall into two categories:

- Legal data (land bank).
- Evidence-based analysis and registration of cultivated land (mapping).

Land is the main asset of an agricultural enterprise. It is where the main work takes place. Most of the cultivated arable land is leased land (shares), but while concluding lease agreements for land plots, it is not always possible to check the location, which creates the so-called “strip farming” (overlapping of field strips). To be sure of the accuracy of dividing personal and leased territory, FMS with the help of PCMU (public cadastral map of Ukraine) provides the function of designation, control, and accounting of the land bank.

The second, important element of working with land is the possession of information about the actual state of the soil on the cultivated land and the ability to view data from each field in retrospect according to different indicators. Regarding the state of the soil, it should be mentioned that today many laboratories offer services of agricultural analysis and soil diagnostics. They take samples and carry out a comprehensive agrochemical analysis of the soil to provide the agronomist with key information on soil condition. The task of the FMS system is to automatically systematize and visualize the information received in the form of cartograms for each plot, which will provide a more accurate analysis and save the agronomist’s working time. The second function of FMS is to create cartograms that will help the agricultural manager see the history, characteristics, or economic efficiency of the selected field.

Farm operations planning

Planning works for the season is an important task for the field manager and the agricultural enterprise in general. The yield and, accordingly, the financial result of the entire season depend on the correctly and timely planned and completed work. Thanks to the use of FMS, management develops technological operations, taking into account potential economic efficiency by assessing future costs and forecasting yields. The planning can include not only the selection of crops and the planning of work for the season but also the calculation of fertilizers needed, plant protection products, seeds, POL, depreciation and wages. The use of FMS allows you to build a strategy, conveniently and accurately assess the economic efficiency, analyze the cost of the developed agricultural operations for a crop, field or workers. A task manager will allow you to timely and correctly notify employees about the required range of tasks with precise instructions.

Monitoring and analysis of completed work

In the management of an agricultural enterprise, apart from correctly planned operations, an important aspect is the implementation of the selected solutions. While monitoring and correcting actions is a priority for private farmers, corporate management wants to make sure that the chosen technologies are adhered to while working in the field. Also, the module for monitoring and analyzing operations allows users to predict the effect of the actions on the final goal.

One of the common module tools is Telematics. It is integration with the vehicle monitoring system, which allows controlling all daily working processes in the fields, monitoring the productivity and movement of equipment and receiving automatic warnings in case of unplanned work. In FMS, monitoring functions allow real-time analysis of the work: how many hectares have been cultivated, how much remains to be processed, how fast the equipment is moving, how long it took to finish the work, how much fuel was consumed. Many agricultural enterprises already have GPS-monitoring systems for equipment and fuel control.

Their use helps to protect the company from theft. The advantages of FMS are that the features of these systems are much broader. They help to automatically calculate the area of cultivated hectares (taking into account overlaps and self-intersections), pre-distribute fuel, monitor the speed and quality of work.

Crop monitoring

An important part of the agricultural enterprise work is planning of agricultural operations and real-time monitoring of the crops condition, which helps to identify deviations in plant growth and development on time, determine the causes of these deviations and make appropriate management decisions. There are many ways to monitor crops during the season, such as going out to the field, analyzing soil samples, using data from drones and satellites, etc.

One of the popular solutions used for scouting “from the sky” is the technology of observing changes in the vegetation index obtained by analyzing satellite images. The normalized relative vegetation index — NDVI (Normalized Difference Vegetation Index), characterizes the density of vegetation and allows farmers instantly assess germination, growth, weeds or diseases, as well as predict the productivity of fields. As a result, one can get a full analysis and identify areas that need reseeding, application of PPP or fertilizers. There are also less popular vegetation management metrics, for example, the EVI (Enhanced Vegetation Index), GNDVI (Green Normalized Difference Vegetation Index), which evaluate various indicators according to the needs of a particular enterprise.

Agricultural scouting is an important procedure for collecting information from the field, which is based on the experience of an agronomist. It helps to control the quality of work performed, determines the state of crops (vegetation stage, activity, health, diseases and pests) and develops technical specifications for processing fields. Each agriculture scout should have about 10 thousand hectares, where he monitors the situation, goes for inspection, generates reports, creates recommendations for production. Modern FMS can significantly facilitate and automate the scout’s work and provide real-time information for management.

Production economics and analytics

The goal of agricultural production, like any business, is to make a profit. In order to effectively manage production and obtain economic benefits, it is necessary to control and itemize expenses, to have an up-to-date daily plan-fact analysis. FMS allows you to receive the latest information on costs for all operations and make appropriate management decisions to improve the situation. Managers’ tasks of the performed work tracking have become easier due to the automatic creation of write-off certificates of seeds, plant protection products, fertilizers.

Digitalization of the document flow

One of the advantages of using FMS is the ability to switch to electronic document management. Each agricultural company tries to keep a detailed record of all completed operations, purchases, and certificates. Automation of the entire workflow includes the creation of electronic reports of completed work, decommissioned inventory, the use of technology. Another important aspect is the connection of electronic documents with the company’s accounting system.

Grain logistics, control from harvest to elevator

An important aspect for large agricultural producers is control and subsequent costs for already produced products. Thus, among the management of agricultural companies there is a need to keep detailed records of grain logistics costs. Thus, a manager gets an opportunity to save some of the resources by choosing the optimal supply chain. Additionally, it can prevent possible theft and loss on the road.

Sales and marketing

In addition to the production cycle, companies need to take into account marketing operations for manufactured agricultural products and the corresponding transfer of proceeds to expenses to calculate the profit obtained. In various FMS, the functionality of selling products is needed to record all legal documents in the company’s database.

Feature set (evaluation between 1 and 3)	Land bank management • reconciliation of fields boundaries • cartograms • agreements • cropping history	Farm operations planning • calculation of the need for application • orders issuing • variable rate application	Monitoring and analysis of completed work • equipment control and telematics • seeding control	Crop monitoring • mobile scouting • satellite images • meteorological observation • additional tools	Production economics, accounting and analytics • accounting system • business analytics	Digitalization of the document flow • electronic document flow	Grain logistics, control from harvest to elevator • grain collecting and weight control • creating the most convenient route	Sales and marketing • CRM • price monitoring • stock exchange	Availability in Ukraine	Value per annum	Integration *Note: each FMS can be individually customized and integrated with third-party services via API*	
AgriChain									+	payment for the module		**AgriChain**
Agrivi									+	19$ per user	GPS trackers and weather sensors, more than 10 brands of equipment	**Agrivi**
AgroOffice									+	290–890€ for 1 out of 6 modules	John Deere, AGFINITY, CLAAS Telematics	**AgroOffice**
AgroOnline									+	1$/ha per year	1C, GPS, meteorological sensors and precision farming technology	**AgroOnline**
Azure FarmBeats									-			**Azure FarmBeats**
Cropio									+	1$–5$ per ha	1 C, GPS trackers and weather sensors	**Cropio**
Document Online									+			**Document Online**
FarmCommand									+	3.5$–13$ per ha		**FarmCommand**
FarmingOS									+	0.70$/ha per year	1C, 1C Agro Web, CROPIO, SAS powered by CROPIO	**FarmingOS**
FarmERP									-			**FarmERP**
FarmLogs									-			**FarmLogs**
Forland									+	on request		**Forland**
Granular									-			**Granular**
Hummingbird									+			**Hummingbird**
OneSoil									+	free	OneSoil sensors	**OneSoil**
Smartland									+	on request		**Smartland**
Soft.Farm									+	0.5$/ha per year	1 C, GPS trackers and weather sensors	**Soft.Farm**
Taranis									+			**Taranis**
Trimble Ag Software									+	from 199$ (excluding VAT)	Possible to integrate with external systems via API. Integration with John Deere, CNH, 1C systems	**Trimble Ag Software**
Agrocontrol									+	on request	Open API with many methods to enable two-way integration with other systems. Power BI, 1C, Wialon, Cropio, ‘‘Slavutich’’ (iAZS), Medoc, Meteotre	**Agrocontrol**
In-Agro (1C)									+	on request		**In-Agro (1C)**
1C Agro Web									+	1$/ha per year	CROPIO, SAS powered by CROPIO	**1C Agro Web**

FARM MANAGEMENT SYSTEMS

Multipurpose systems for planning production processes that establish a logical connection between blocks with customizable access to information, and provide the ability to create management reporting based on the results of work.

AgriChain

AgriChain is a comprehensive online system of IT solutions for agribusiness management, developed by the AgriChain, part of the Astarta-Kyiv agro-industrial holding. AgriChain is a multi-modular platform that combines solutions for business processes and effective management of all areas of an agricultural enterprise: landbank management, production, crop monitoring, warehouse management, procurement and supply of goods and materials, control of equipment and repairs, logistics of goods and materials and finished products.

The concept of AgriChain is based on full integration with the 1C system, data from various equipment and telemetry (GPS trackers, FLS, filling stations, trailed tags, RFID, data collection terminals, on-board computers, weather stations, soil sensors, etc.), basic and meteorological data, which are consolidated in a single system for further analysis, processing and making management decisions based on risk management.

AgriChain consists of 8 modules, each of them fully covers the needs of a separate block of the production chain. The architecture of the solution consists of independent WEB and mobile applications with subsystems in 1C accounting system for all functional modules, which are united by a single authorization WEB application (user entry point). It is possible to use one or several modules, as well as combine them with third-party services:

Feature set of AgriChain modules

AgriChain Land

Module for managing a land bank in the form of a WEB application and an integrated 1C configuration. Covers databases of all fields and plots of the company (own interactive cadastral map), management of exchanges of plots, leases, payments, and charges, including cost budgeting.

The system is built based on task management functionality and contains many analytical reports on land bank management based on risk management, analysis of underprocessing, overworking, and losses on leased plots. The functionality of the land module allows to avoid common risks that lead to direct financial losses, for example, inaccurate or untimely information, discrepancies in the area of leased and cultivated plots, disruption of work activities under land lease agreements, and many others.

AgriChain Farm

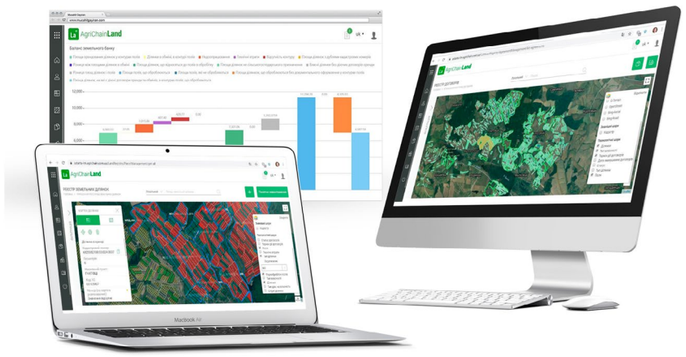
Production process control module in the form of a WEB application (planning and managing a production program), mobile application (operational planning and executing a production program), and a subsystem in 1C system for a document management system associated with displaying business operations.

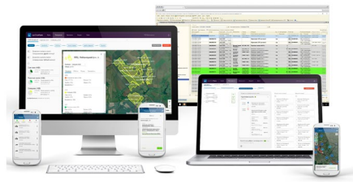
The main tasks of the system are seasonal planning of the production program, construction, and automation of business processes for managing the operating cycle based on a seasonal plan between services: agronomic, engineering, dispatching, warehouse, economic, and accounting in real-time. AgriChain Farm module allows increasing the level of implementation of the planned production program using resources (goods and materials and equipment) and the implementation of the norms of technological operations.

AgriChain Scout

Module for monitoring state of crops, their analysis, and dynamic forecasting of yield in the form of a WEB-application and a mobile application with integration with 1C accounting system. The main tasks of the system are to build a culture and business processes for systematic monitoring of crops by the agronomic service, which in real-time assesses the condition of crops for effective risk control and making the right management decisions.

The system allows to collect information about the state of crops from various sources (historical, satellite, aerial photographs), automatically schedule field inspections, plan individual inspection rules in relation to the crop, timely identify risks - diseases, pests, weeds for making decisions on their prompt elimination through additional processing tools and assessing their economic efficiency, receive operational business analytics and reports on the state of crops.





AgriChain Barn

Module for managing the warehouse logistics of an enterprise in the form of a mobile application and a subsystem in 1C accounting system for document flow automation.

The main tasks of this module are to build effective warehouse logistics using additional equipment (data collection terminals, barcode printers, scanners), which allows building business processes for effective management of goods and materials movement, quality control, control of movement and disposal of containers, such optimize logistics costs and warehouse balances.

AgriChain Kit

Module for managing the company's business processes in the form of a WEB-application.

This solution is integrated with other modules of the AgriChain platform, while setting up business processes is implemented as a flexible constructor (to cover the request and characteristics of any company), which, in the event of changing external and internal business conditions, makes it possible to quickly adjust the work of the company, creating at the user level the most complex diagrams of business processes, personalize areas of responsibility, build management of tasks for specialists, control the timing of their implementation.

AgriChain Logistics

Module for managing the logistics of goods and materials (warehouse-field) and products from the field (field-elevator/sugar factory-warehouse) in the form of a mobile application and 1C subsystem for document flow automation (universal TTN), a logistician workstation for managing own and hired transport. In 2021, it is planned to integrate the system with weighing complexes (streaming and stationary) and a GPS monitoring system. The main tasks of this module are to reduce logistics costs, implement an electronic queue to optimize the load on elevators, make the best use of our own and hired vehicles, automate the workflow associated with the transportation of goods and materials and products, increase control and transparency of the process of transporting products from the field to storage sites.

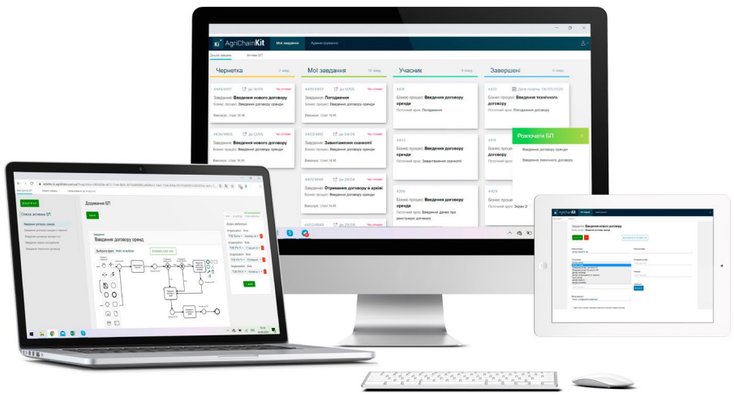
The following modules are expected to be released in the near future:

AgriChain Auto

Module for monitoring the operation and repairs of equipment (own GPS monitoring system) in the form of a WEB application, the first release of the module is planned in the first quarter of 2021.

AgriChain Report

Analytical reports module in the form of a WEB-application, it is planned to use the BI system as part of the AgriChain portal. The release is scheduled for December 2020.



Functional blocks of AgriChain

- Land bank management
- Production planning and management
- Crop management
- Management of the warehouse, procurements and commodities and materials supplies
- Constructor for creating and managing business processes

Modules that are in development and expected to be released before the end of 2020:

- Management of logistics of products and goods and materials
- Transport and repair management
- Analytical reporting system

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Price

0.5$/ha per annum

It is possible to purchase the system as a boxed solution with a one-time payment.

Integration

- 1C
- GPS trackers
- Gas stations
- FLS
- RFID tags
- Data collection terminals
- On-board computers
- Meteorological stations
- Soil moisture sensors
- Satellites

Agrivi

Agrivi was founded in 2013 with the mission to transform at its core the way food is produced and positively impact billions of lives, helping farmers achieve sustainable, resource-efficient and profitable production. Agrivi consists of three-level system:

- Farm management
- Management of a cooperative or farm association
- Enterprise farm management

Feature set of Agrivi module

Farm operations planning

Agrivi farm management helps you plan, monitor and analyze all activities on the field and farm. Tillage, planting, crop protection, fertilization, irrigation, harvesting and all other actions are registered in the system automatically or with a few clicks. The system also helps to keep track of the quantity of the used fertilizer, costs and work hours for every activity.

Grain logistics, control from harvest to elevator

The software allows you to track each unit of manufactured products at any stage of the production chain and sales, using the built-in tracking system.

Crops monitoring

The system provides 7-day weather forecast and 3-year history for every field. Advanced detection algorithms alarm farmers if there is a risk of pests or diseases on their fields.

Also, NDVI helps farmers search anomalies in their fields that could not be detected with the naked eye. Used primarily for arable crops due to its high biomass density, NDVI helps identify changes in biomass growth on farmers' fields.

Production economics and analytics

The system allows consolidate and store financial statements and farm documents in one place. Also Agrivi provides possibility to create and control a central registry of employees, seasonal workers, machinery and fields. Real-time inventory status of each warehouse and bin helps to avoid low inventory bottlenecks and keeps your operations running smoothly.

Thanks to the analytics block one can determine the difference in yield, costs, calculate the exact cost per ton for each crop and field, and also calculate the ROI for every crop production. Built-in reports allow you to get all important data in PDF, Excel or Word formats.

Functional blocks of Agrivi

- Farm operations planning
- Crops monitoring
- Production economics and analytics
- Grain logistics, control from harvest to elevator

Visit page

Price

19$

per user

Free trial

Agrivi provides free access for the first 14 days.

Integration

- GPS trackers
- Meteorological sensors
- More than 10 types of equipment

AgroOffice (Yara)

Yara is one of the world's largest suppliers of mineral fertilizers for agriculture. Recently the company developed and launched its own solution for farmers — Agro Office. It is software that gives farmer access to all the information about the fields and crops in order to conduct a detailed analysis of yield, application, seeding, soil and other data. Thus, it becomes possible to determine the causes of certain conditions and make timely and informed decisions.

The system also automatically collects data from telemetric and wireless data transmission systems, providing information about the yield, the cultivated area, the specified rate, the applied rate, fuel consumption, fuel level in the tank, the location of the machine and more. Agro Office integrates with all available equipment — Ag Leader, John Deere, Trimble, Topcon, Claas Telematics and many others.

Feature set of Agro Office (Yara)

Land bank management

- The basis for farm management and precision farming is the Agro Office Maps module — a cartographic system that displays extensive information on any field. It is enough to circle the contour of the field on the map, and the system will automatically show information about the plot. It is also possible to create various cartograms that display information about the state of the field.

Monitoring and analysis of completed work

Yara Agro Office Field allows farmers to get all the information about their fields and crops at once. Farmers can conduct detailed analysis to determine the reasons for certain conditions (for example, low or high yields) and make decisions.

Agro Office Field is a new generation of farm management information system. Instead of the traditional manual recording, the module automatically collects data from telemetry systems, providing information on the cultivated area, fuel consumption, fuel level in the tank, vehicle location and more.

Agro Office GPS Tracking is a real-time telemetry and telematics system. It is based on secondary-market hardware devices (GPS trackers) installed in agricultural machines and equipped with SIM cards for data transmission in real time mode. The Agro Office ® GPS server "listens" to all devices, stores data and displays it on the map.

Agro Office Fuel is a system for petrol stations and fuel trucks with triple fuel control.

- Fuel quantity in each car/by each driver;
- Fuel quantity in the tank of the filling station and description of supplies;
- Quality of fuel consumed by each machine and for which area/activity.

You will get a complete picture of everything that happens with the petrol station on your farm. The system is designed for filling stations, fuel trucks, stationary or transportable fuel tankers. In Agro Office Fuel, you can see, on the one hand, all fuel supplies, and on the other, every refueling made, including information about the date and time, car/driver, refueled quantity and location. The system is completely autonomous — does not require the participation of a designated operator; that is why it greatly reduces the risk of errors or fuel theft.

To refuel, the driver must identify himself and/or the car using an RFID chip.

Production economics, accounting and analytics

Agro Office ® Stock is a warehouse management system that allows you to track stocks and inventory. The module is integrated with Agro Office ® Field, so daily incoming records automatically reduce inventory. All data can be exported to ERP/accounting system.

Features:

- Unlimited quantity of suppliers, products and warehouses.
- Reservation of expandable materials — from supplier to warehouse.
- Delivery of products — from the warehouse to the field.
- Internal transfers (between warehouses).
- Cost calculation — for farm, field, and crop.
- Inventory checks.
- Printing documents.
- Notifications for low inventory.
- Integration with Agro Office Field.
- Data export to external accounting software.

Functional blocks of Agro Office

- Land bank management
- Monitoring and analysis of completed work
- Production economics, accounting and analytics
- Grain logistics, control from harvest to elevator

Visit page

Price

Standard

290€ + 100€

license — annual subscription

Pro

590€ + 150€

license — annual subscription

Super Pro

890€ + 200€

license — annual subscription

Integration

- John Deere
- Agfinity
- CLAAS Telematics

AgroOnline

AgroOnline™ is a service for systematic management of agricultural business, an online platform for comprehensive automation of accounting and management, covering all areas of the enterprise.

A set of tools allows you to build a full-fledged model of effective management of an agricultural enterprise.

Asset Accounting covers all the resources used by the enterprise:

Accounting and control of the land assets

Electronic map of fields and leased plots, field passports, dynamics of changes in the land bank, control of contracts and financial settlements, as well as all related business analytics: ratings, slices, risks, losses, etc.

Recording of the qualitative composition of soils

It includes maps of agrochemical composition and soil density in the context of all micro and macro elements; dynamics of composition changes.

Recording of goods remaining and movement of material resources:

warehouse accounting, movement of resources within the company, calculation of the cost of materials, procurement planning, integration with external systems: 1C, refueling, weighing, video surveillance systems.

Management of other resources (internal and rented):

employees, consultants, contractors, machines, units, infrastructure facilities, etc.

Fully understanding the availability and quality of production resources, we proceed to the next stage — System planning:

Digital technological maps

It includes planning of technological operations, power supply and protection systems; target standards of materials application, load on equipment, logistics and additional costs of manual labor; automatic planned calculation of the economy, required resources and their cost, summary and detailed analytics of planned activities.

Planning with the consideration of field heterogeneity

It is a modern approach to planning, based on task maps for precision farming techniques: a sectional approach to seeding, nutrition, and plant protection; constructor of differentiated maps, arbitrary data layers, comparison of planned and actual works based on equipment logs.

Digital crop rotation

An up-to-date map of the crops location and the history: arbitrary analysis periods, individual technological maps for each field and the ability to work with certain areas of fields. Automatic work plan, budget, purchasing plan and harvest plan.

Understanding of the entire planned economy:

- the volume of the harvest and its cost;
- costs per hectare including materials, mechanization, logistics and manual labor;
- planned profitability and marginality.

Next task is implementation of the plan. At this stage management of two aspects of the manufacturing process is critical:

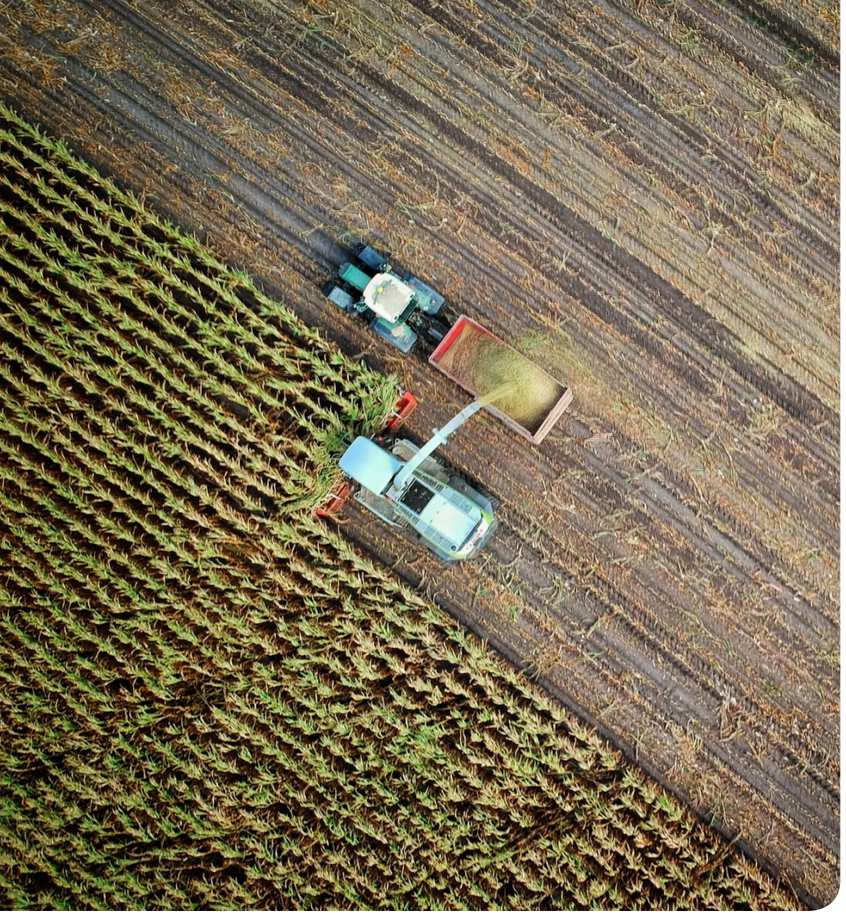
Monitoring the completeness and quality of planned operations, and monitoring deviations in the development of crop vegetation

As part of the monitoring of vegetation, AgroOnline provides a whole range of tools:

- Satellite monitoring with automatic fixation of abnormal development zones; a set of indices for determining the quality of vegetation, the moisture in the plant and the foliage density.
- Monitoring use of drones and UAVs; photo/video monitoring with conventional and multispectral cameras; construction of vegetation status maps, relief maps, weeds maps, flood maps, snow maps, work assessment maps, seedling counts, etc.
- Routing of field inspections: routes for agronomists' inspection, flight missions for drones.
- Field tablet of an agronomist for fixing the state of crops, GPS navigation of movement across the field, methods of conducting field examination, catalogs of diseases, pests and weeds, the ability to open access to consultants to analyze situations.

Both standard and additional equipment are used to control the completeness and quality of work:

- GPS Monitoring of equipment based on trackers; one monitoring window for the entire fleet of vehicles in real time; control of movement, parking, speed and weather conditions.
- Advanced sensor based control: of fuel consumption, driver identification, unit tags, work performance indicators, standard CAN tires sensors, etc.



- Trip tickets with automatic calculation of the cultivated area, time spent and fuel consumed. Integration with accounting systems: orders, write-offs, etc.
- Meteorological monitoring. Integration of weather stations, weather forecast according to field coordinates, calculation of meteorological characteristics, and coefficients, hourly and daily weather, weather maps (cloudiness, precipitation movement, and wind).
- Loading and unloading data from precision farming terminals: comparison of planned and actual maps of equipment and units operation.

At each stage of production, AgroOnline provides continuous business analytics of production, which is updated daily.

- Plan/fact of completeness and quality of work: for each field, for each operation.
- Plan/fact of the economy: control of the cost of production for each field in the context of materials, mechanization, logistics and manual labor.
- Flexible constructors of operational and aggregate reports: material consumption, work of employees, dynamics of work performance, work of equipment, fuel consumption and many others

Boot-up process

AgroOnline pays great attention to integration. The result is important to us and that is why we participate in modernization of an enterprise.

First, we deal with the current situation (we audit business processes and make a review of the available tools). The next step is to determine the intended goal, write a roadmap (integration plan). We digitize the enterprise and implement the necessary technologies. We provide training for local employees and distribute rights and access to the system. Afterwards, we connect it to the online training platform, where the completeness and quality of employee knowledge is monitored.

Dispatch automation

The solution to the problem of lack of qualified specialists in the field is the dispatcher. Prompt collection and processing of information, tracking the correctness of business processes, providing recommendations and consultations at any time — these are the functions that will help enterprise to organize the processes in the enterprise more flexibly.

Functional blocks of AgroOnline

- Land bank management
- Production economics, accounting and analytics
- Crop monitoring
- Farm operations planning
- Monitoring and analysis of completed work
- Satellite monitoring
- Scouting
- Drone monitoring
- Telemetry
- GPS equipment monitoring
- Crop rotation planning
- Plan-fact analysis
- Meteorological observations
- Moisture index
- Dispatcher terminal
- Task maps for precision farming techniques
- Grain logistics

Visit page

Price

1$/ha per annum

It includes year license, digitalization of the enterprise, integration, training and upcoming updates.

Integration

- 1C
- GPS trackers
- meteorological sensors and precision farming technology

Cropio

Cropio is an FMS system for remote control of agricultural enterprises, which allows real-time monitoring of the state of crop areas, auto-documentation, forecasting and planning of agricultural operations.

Created in 2013 by New Science Technologies, Cropio is available in 50 countries around the world, including Ukraine, Russia, Kazakhstan, Moldova, Uruguay, Paraguay and many countries in Africa.

The FMS Cropio functionality allows you to monitor the crops state in real time, predict and plan agricultural operations, form yield forecast. The system is based on the ability to monitor the situation in fields with agricultural crops, including the level of vegetation, the content of certain minerals, and accurate weather conditions. The work of the system is aimed at identifying the individual characteristics of each field in order to increase yield efficiency and save costs during the processing of each field of the enterprise.

Also, Cropio integrates with 1C, various GPS tracking systems for vehicles, weather stations, drones from different manufacturers, sensors and transmitters. Mobile apps are available for Android and Apple users. Cropio uses imagery from more than 10 different satellites. These are satellites of such systems as MODIS, Landsat, Sentinel-2, Iconos and GeoEye. Pictures are taken on a daily and weekly basis; some pictures are historical and are updated no more than once a year. The system uses images of vegetation with a resolution of 10, 15, 30 and 250 meters per pixel. These images are updated on a daily and weekly basis. More accurate images are also used (with the resolution of 50 centimeters).

Feature set of Cropio

Crop condition

- assessment of the crops condition;
- cropping history;
- vegetation maps;
- maps of relief and slopes;
- accurate weather forecast;
- precipitation;
- soil moisture;
- air and soil temperature;
- active temperatures;
- field inspection reports;
- yield forecast;
- notifications about precipitation and a sharp decline in vegetation.

Agricultural operations

- planning of agricultural operations;
- distribution of seed application rates, ertilizers, plant protection products;
- sampling of soil;
- soil tests;
- soil analysis maps;
- soil texture maps;
- differentiated application;
- planning the harvesting campaign.

GPS-control and telematics

- automatic notifications;
- control of movement of equipment;
- fuel consumption control;
- work status;
- operations history;
- unauthorized work;
- cleaning control;
- weighing;
- flexible adjustment of sensors.

Functional blocks of Cropio

- Field Monitoring

real-time monitoring of field conditions

- Field Analytics

analysis of field condition

- Field Zoning

defining field structure and highlighting problem areas

- Field Tasking

determining tasks for field work

- Precise Weather

updated weather forecast with reference to the location of each field

- N-Deficit

calculation of the recommended dose of nitrogen fertilizers

- Active Control

notification system of significant changes in crops condition

- News & Prices

information on events in the agricultural market, and up-to-date data on price dynamics

- Reporting

weekly and monthly reports on the state of crops, which summarize information on each field, crop and farm as a whole

Visit page

FarmCommand

FarmCommand FMS platform is a digital data management platform developed by the Canadian company Farmers Edge. The system is built on all-in-one principle, and automatically combines data from different sources, providing agricultural producers with what they need most — prompt, accurate information directly from the fields used to assess the situation and make the right decisions. FarmCommand is available as a desktop web platform and mobile application.

Feature set of FarmCommand

Monitoring and analysis of completed work

- Monitoring of the machine and tractor fleet in real time.
- Archive of equipment movement.
- Control of equipment usage technology.
- Analysis of overall performance.
- Transfer and display of data on the map in real time.
- Data is displayed as current, average and control totals.
- Operating mode to view the current readings.
- Monitoring mode for multiple machines.
- Combining information from equipment within the framework of one task.

Production economics, accounting and analytics

Monitoring and benchmarking analysis of key vehicle metrics such as fuel consumption and overall performance.

Crop monitoring

- A network of over 10,000 weather stations around the world.
- Daily weather forecast for 10 days and hourly forecast for 48 hours.
- Archive of weather data.
- Radar and weather notifications.
- Efficient weather forecasting models.
- Modeling the growth stage of crops.
- Predicting the risk of diseases and pests.
- Predicting nitrogen deficiency.
- Automatic synchronization of scouting reports with the FarmCommand platform.
- Identification of problems according to built-in lists of diseases and pests.
- Search for problem areas in the field using GPS navigation.
- Ability to generate photo reports.
- Creation of recommendations on elimination of identified problems directly in the field.

Land bank management

- The system allows you to create more than 12 types of maps: application maps, overlap maps, NDVI and vegetation status map, heterogeneity map, scouting map, yield map, field work planning map, height map and others.

Farm operations planning

- Planning and assigning tasks in advance or along the way.
- Tracking work progress.
- Tasks completion reports.
- Customizable notifications.

Functional blocks of FarmCommand

- Monitoring and analysis of completed work
- Production economics, accounting and analytics
- Land bank management
- Crop monitoring
- Farm operations planning

Visit page

Price

3.5$/ha per annum

Basic access to FarmCommand

3.5–13$/ha per annum

In more expensive packages, the company offers additional devices for a better and in-depth analysis of the farm functioning

Forland

FMS Forland is a multi-module system for automation of production and business processes in agricultural enterprises. The Forland platform is built on a modular basis and covers such areas as land bank management, fuel storage, production and work in the field, logistics, etc. Also, the system allows you not only to control resources, but also to analyze the current situation in the enterprise, the history of fields, make automatic reports, and so on. Based on the reports generated in the Forland system, the enterprise can draw up an operational work plan and monitor its implementation. The system can automatically calculate wages, generate work orders, invoices, and other reports.

Feature set of Forland

Land bank management

- Land bank accounting.
- Accounting of shares and their status.
- Electronic mapping of shares.
- Electronic field mapping.
- Reminder of the contract expiration.

Monitoring and analysis of completed work

- Visualization of fuel movement.
- Accounting of fuel in liters and kilograms.
- Identification of the driver and equipment during refueling.
- Fuel supply to gas stations and fuel tankers.
- Control of the real mileage of the vehicle.
- Control of running hours in special equipment.
- Organization of optimal routes.
- Control of vehicle fuel consumption (refueling, draining, consumption).

Production economics, accounting and analytics

- Transparent accounting of commodities and materials.
- An increase in crop yield.
- Control of all operations and work performance.
- Planning and monitoring of compliance.
- Online control of the entire company.

Crop monitoring

- Growth of the agronomist efficiency.
- Remote control of employees.
- Work planning.
- Registration of weather conditions.
- Scouting, making notes and photos from geolocation.
- Control from the mobile phone.
- Identification of diseases and problems in the field (drought, minerals, etc.)
- Advice from the system for each culture.
- Satellite imagery with scale.
- Field analysis.
- Vegetation changes on the map.

Functional blocks of Forland

- Land bank management
- Monitoring and analysis of completed work
- Production economics, accounting and analytics
- Crop monitoring

Visit page

Price

on request

Integration

- ...

InAgro

In-Agro is one of the first developers of a whole line of specialized programs for agricultural enterprises in Ukraine. The company specializes in the development of specialized solutions for agricultural holdings based on 1C. One of In-Agro's products is the AGRO ERP system.

Feature set of InAgro

Land bank management

Subsystem Land Tenancy is a set of effective tools for managing relationships with shareholders (unit holders). When calculating indicators for the next financial year, the subsystem provides data on the upcoming expenses for land tenancy. In the course of its activity, the company's management gets the opportunity to manage the land bank:

- Registration of all data about the shareholder and the plot.
- Detailed agreements with the possibility to change its terms without changing the agreement itself.
- All forms of payment: cash disbursements, benefits in kind, mixed.
- Compliance with applicable laws.

Farm operations planning, monitoring and analysis of completed work

Planning

- Land bank.
- Creation of crop cultivating technologies.
- Creation of technological maps.
- Structuring of cropped land.

Growing

- Efficient work planning.
- Ordering equipment.
- Agronomist's log.
- Registration of the work performed.
- Harvesting.

Transport

- Accounting of transport cards.
- Rationing of transport works.
- Distribution of equipment.
- Display of transport sheets.
- Maintenance.

Repairs

- Description of repair work.
- Planning of repairs.
- Formation of the repair schedule.
- Renovation work.
- Registration of transport defects.
- Calculation of cost.

Grain logistics

The module makes it possible to:

- take into account the quantitative changes in grain, including its quality indicators both for company's grain and grain supplied by customers;
- keep account of services connected with storage, grain processing, etc. and settlements with customers;
- control the presence and movement of grain;
- provide operational information about the state of grain remains in storage facilities.

Functional blocks of InAgro

- Land bank management
- Farm operations planning, monitoring and analysis of completed work
- Grain logistics

Visit page

Price

on request

Free trial

Integration

- ...

Smartland

Smartland is FMS, business accounting and online farm enterprise management system. Smartland online modular system provides services for precision farming and provides comprehensive control of all business processes in agriculture.

The advantage of FMS is that Smartland offers flexible, customizable modular software that helps to manage each operation.

Feature set of Smartland

Land bank management

1. Cadaster — the register of the land parcels of an agricultural enterprise that includes information on land lease. It provides storage of data on cadastral numbers of land parcels of a farm enterprise. The module is synchronized with the cadastral map of Ukraine. The cadaster automatically reminds of the need to extend the lease of land parcels.

2. Fields — information on the fields of the agricultural enterprise. It includes data on crops growing in the fields (variety, yield, etc.). Provision of NDVI satellite maps, relief and soil density maps.

Monitoring and analysis of performed work

You can control the movement of fuel in the agricultural enterprise. There is possibility to connect both fixed and mobile gas stations of the enterprise. Also module provides card access to the gas station; control of fuel residues at all filling stations of the enterprise in real time; data on all fuel supplies at the enterprise, as well as the history of fuel dispensing.

Control over the agricultural work at the enterprise in real time. It provides display of the movement of agricultural machinery, its stops and parking on the route; speed control during field operations; provision of reports and notifications upon completion of work; history of completed work with indication of route, work time and fuel consumption.

Module also gives information about the technical equipment of the agricultural enterprise; data on the technical characteristics of self-propelled and trailing equipment; historical data on equipment maintenance and replacement of parts. Module sends notifications on the need to change details and monitors usage of spare parts.

Another advantage is the adaptability of the system and its availability both via a browser and in an application on a smartphone or tablet.

Additionally, Smartland provides services for automating business processes at a farm enterprise:

- measurement and creation of an electronic map of fields;
- measurement of soil density;
- connection to RTK signal;
- installation and modernization of equipment for petrol stations and machinery (flow meters, course indicators, fuel level sensors).

Functional blocks of SmartLand

- Land bank management
- Monitoring and analysis of completed work

Visit page

Price

NNN

Integration

- ...

Soft.Farm

Soft.Farm is a Farm Management System, a comprehensive IT solution for agricultural producers, which in live-time mode allows you to combine data from a variety of available sources into a single format and create an analytical system for agricultural activities, needed for making operational management decisions.

The main advantage of the product is that it is developed in close cooperation with farmers on the local market and takes into account their needs. FMS Soft.Farm considers every aspect of the work of agricultural producers and combines the main agronomic IT tools that are necessary for the implementation of precision farming. The system consists of the following main modules:

Feature set of Soft.Farm

Land bank management

Solution provides information from open sources on cadastral data, land bank analytics, revealing the “strip farming” (overlapping of field stripes) and areas owned by other tenants; shares with no property records or information that has been entered into the State Geocadastre.

You can add not only data about tenants, the duration of lease agreements and registration documents, but also define field borders and departments, exchange fund, additional information about the land unit, and much more.

Cartogram module

It uses basic visualization types and shows field characteristics: soil property maps, seeding and yield maps.

Soil assessment data are loaded into the cartogram module, which will build a map of the distribution of indicators over the field.

Agricultural operations

- planning of agricultural operations;
- distribution of application rates for seeds, fertilizers, plant protection products;
- sampling of soil;
- soil tests;
- maps of soil analysis;
- maps of soil texture;
- differentiated application;
- planning the harvesting campaign.

Crop monitoring

Analysis by various vegetation indices: NDVI, EVI, GNDVI, CVI, True Color, which characterize various qualitative and quantitative indicators in accordance with the needs of a particular enterprise.

It gives access to satellite data and information from weather stations of different manufacturers in one interface; the possibility to download indicators from soil moisture and temperature sensors, which are installed across the field, from 50cm to 1m under the ground, and transmit information to the server for 20 years.

Monitoring and analysis of completed work

- automatic notifications;
- control of equipment movement;
- control of fuel consumption;
- work status;
- operations history;
- unauthorized work;
- control of cleaning;
- weighing;
- flexible adjustment of sensors.

Production economics

In order to manage budgets for fields and crops effectively, you need to have an up-to-date plan-fact analysis every day, which is available in Soft.Farm. Instant display of cost information allows you to make appropriate management decisions and change the situation.

Functional blocks of Soft.Farm

- Land bank
- Agrotechnology
- Telematics and GPS-monitoring of equipment
- Satellite images, NDVI index
- Agroscouting
- Cartograms
- Online cost control
- Meteorological observation
- Seeding control

Visit page

Mobile application for scouting

This is the agronomist’s main tool for routine field surveys and reporting. While inspecting crops, the app helps you identify problem areas and take photos in the field. In this case, the mobile device records the GPS coordinates of the images and adds information to the report:

- identified pests, diseases, weeds;
- phase of plant development;
- determination of the risk group;
- description of the state of crops.

The mobile application functions as a navigator of fields and problem areas, which were identified using satellite monitoring and the NDVI index. Web version allows you to give new tasks for field survey from a computer to a mobile device.

Price

0.5$/ha per annum

Free version

Users get free access to some of the functional features for. To connect to the Telematics, Land Bank, Satellite Imagery and Meteorological Observation modules, you will need to purchase paid access in the form of cloud or packaged software.

Integration

- 1C
- GPS trackers
- Weather sensors

Agrocontrol

FMS platform Agrocontrol is used for web-monitoring of agricultural equipment and fields, analysis and accounting of field work, crop and fuel management, helps to control the designated use of equipment. The platform allows you to automate production processes in agriculture, excludes the human factor as much as possible, helps to identify theft of POL, manufactured products, plant protection products, etc. The platform allows online monitoring of technological operations and recording possible deviations during field work. Weather stations, satellite images, integration with UAVs allow the agronomist to make effective decisions on time. Automatic recording of field work, fuel consumption, calculation of the worked area, identification of the operator, allow you to automatically generate a trip ticket without visiting the field by accountants or agronomists. The platform processes online data from a variety of sensors used in agricultural enterprises, fields, agricultural machinery using GSM communication. The user at once sees all production processes of the enterprise and can efficiently make important decisions on time.

System module functions

GPS monitoring, fuel control

The platform detects the facts of fuel abuse, generates online messages on the fact of draining, refueling. Monitors the operation of equipment in the online mode and, in case of deviations, signals in the form of SMS, messages in Telegram, by email.

Land bank accounting

Reducing the risk of land loss. Electronic map of land plots, register of lease agreements. Contracts and accounting of exchanges with full visualization. Calculations of payments to shareholders. Determination of technical losses and land that are at risk. Determination of the actual cultivation of areas with areas according to documents. Determination of strategic land plots, the ownership of which is extremely important for the enterprise, as well as those fields or plots that are surrounded by competitors' plots, for which it is very difficult to deliver equipment and because of which the enterprise incurs additional costs.

Field map

Crop rotation history (variety / hybrid), plan, fact, gross yield and yield. Dates of beginning work, sowing, harvesting. Vegetation, history of agricultural work (machinery, hectares, fuel), materials (plant protection products, fertilizers, seeds, fuel), yield forecasting, review reports. Total costs per field and per hectare.

Agro-operations, waybill

Planning, technological map, profitability, orders. Automatic calculation of the required materials, checking the residues on the trains. Automatic calculation of processed areas, crossings, fuel spent, generation of waybills. Comparison of the plan and the fact of the field work.

Goods and materials

Counterparties, compositions with materials, inventory of balances, receipts from the supplier, write-off for agricultural operations, return to the supplier. Cost of materials, leftovers online.

Gas station, refueling

Automation of filling stations and tankers. Blocking the issuance of fuel, receiving fuel by RFID cards. Writing or blocking cards over the air. Automatic control of the filled and used fuel. Barrel leftovers online. Automatic arrival of fuel to fuel trucks. Sending a report to the tax office on the composition of fuels and lubricants, which are subject to excise duty. Accounting for fuel dispensed from one barrel by enterprises.

Meteorological stations

We offer weather stations of our own production, we integrate into the system of other manufacturers. Temperature and humidity of soil, air. The amount of precipitation for the period, the average daily, average monthly air temperature, the sum of effective temperatures. Wind speed and direction. Controlling the operation of sprayers in the fields (wind speed, air temperature, travel speed).

Agroscouting

A mobile application that allows an agronomist to create field reports, take photos, describe them, indicate the phase of development, the number of plants per square meter, the level of soil moisture, etc. scale BBCH.

Mobile agronomist

A mobile application that allows an agronomist to write off materials in the fields, close agricultural operations and check the facts of field work.

Satellite monitoring, NDVI, EVI2, GNDVI, NDMI

Satellite images of fields, plant vegetation indices NDVI, EVI2, GNDVI. An indicator of the moisture content in the soil and leaf of the plant. Identification of fields with weeds and fields that are lagging behind. Fixation of zones of inhomogeneity, sifting, etc.

Yield forecasting

Based on satellite images and vegetation indices, weather station data, historical data, the genetic potential of the variety, artificial intelligence, the platform predicts the future harvest in the context of fields.

Soil analyzes

Display of the results of agrochemical soil analyzes. Interpolation. Sample points and values by type of analysis in the context of fields.

Cleaning, control of friend or foe

Control of harvesting and accounting. Blocking the operation of the auger, PTO. Receiving products using RFID cards, recording cards by air with the ability to indicate from which combines or PBNs you can get grain. Gross harvest in the context of fields, crops, harvesters. Accounting for transported grain PBN.

Weighing station/elevator

We make our own controller for connection to the weight processor and install moisture meters, which we also connect to the controller. Automatic vehicle identification by RFID card. Integration of video monitoring systems for an event during vehicle identification. Linkage of unloading to each weighing. The nature, moisture content of the grain. Control of the weight taken from the field with the weighing machine. Compositions, laboratories, drying. Balances online.

Online delivery to the elevator

Online display for control of grain carriers when receiving products in the field and moving to the weighing, elevator. Automatic calculation of mileage, time in motion for each walk. Closing the walkway after weighing or after leaving the geofence of the weighing and elevator. Control of grain taken and not brought to the weighing facility.

Video monitoring

Own file server. Systems for video monitoring and photographic fixation for tankers, for monitoring refueling in canisters, harvesters, PBN, for controlling who the product is being shipped to. Weight, car license plate, body check, weight. Control of preparation of mixtures for sprayers.

Sending messages

Automatic control of events and sending SMS, messages to Telegram, by email. Work in the field without an assigned unit or without identification of the operator, control over data transmission by a GPS tracker, and the operation of sensors. Control over the implementation of technological operations (speed of movement during sowing, harvesting).

Routes

Control of vehicle movement along a specific route. Deviation from the route, control of the time for which the route must be completed, stops on the route, the beginning and end of the route, speed control.

Functional blocks of Agrocontrol

- GPS monitoring, fuel control
- Land bank
- Agro operations, waybill
- Field map
- Goods and materials
- Gas station, refueling
- Meteorological stations
- Agroscouting
- Mobile agronomist
- Satellite monitoring
- Yield forecasting
- Soil analyzes
- Cleaning, control of friend or foe
- Weighing station/elevator
- Online delivery to the elevator
- Video monitoring
- Sending messages
- Routes

Visit page

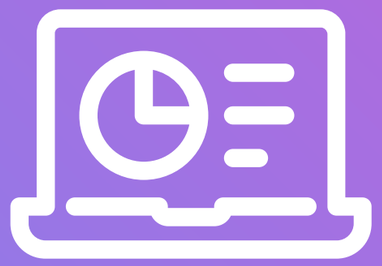
Price

on request

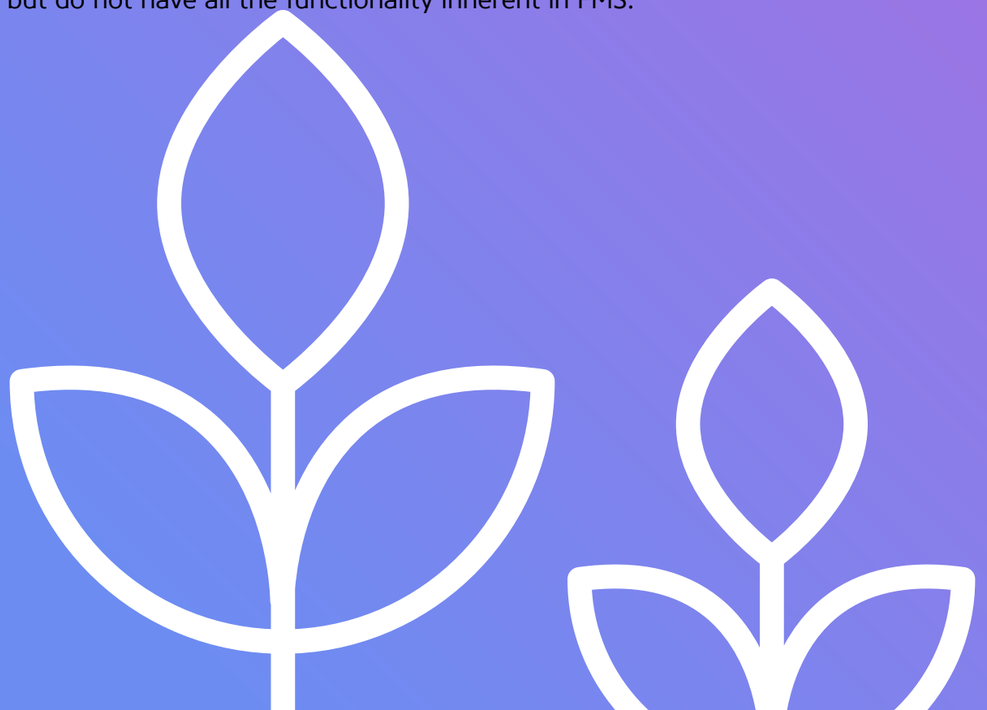
Integration

- Open API with many methods to enable two-way integration with other systems.
- Power BI
- 1C
- Wialon
- Cropio
- "Slavutich" (iAZS)
- Medoc
- Meteotrek

MODULAR SOLUTIONS



Complex solutions, which consist of several functional blocks, but do not have all the functionality inherent in FMS.



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Azure FarmBeats

Visit page

FarmBeats is a Microsoft pilot project that combines IoT devices, data analysis, and machine learning to make agribusiness better. Azure FarmBeats is a purpose-built, industry-specific cloud platform built on top of Azure to enable actionable insights from data.

FarmBeats benefits for farmers:

- Aggregate agricultural data from different sources.
- Fuse different agricultural datasets from sensors, drones and satellites.
- Build AI/ML models using fused datasets.
- Create a customized solution for digital agriculture.

FarmBeats offers the following basic features:

- Create digital maps of farms.
- Track farm health by visualizing ground data collected by sensors from various sensor vendors.
- Assess the current condition of the farm using vegetation index and water index based on satellite imagery.
- Create soil moisture map based on the fusion of satellite and sensor data.
- Plan and conduct crop reviews using aerial imagery from our partner drone companies.

Document.Online

Visit page

FarmLogs is a comprehensive program that allows farmers to manage all aspects of their business. It is also available as an app for Android and iOS devices. FarmLogs makes it easy to log and review field activities in one place. Recordings will be organized, secure, and accessible from any desktop or mobile device. The use of interactive maps allows assess the results of seasonal work and get an overall idea of the yield performance. It is also possible to track current prices benchmarked against daily price fluctuations. FMS allows you to study weather conditions, track every day how many units of heat are accumulating in the fields this season, and compare with previous seasons. Whether crops are in an early growth stage or are rapidly approaching maturity, FarmLogs helps users plan field work efficiently with continuously-updating growth stage and maturity estimates.

Benefits of Document.Online

Optimization of the enterprise performance

Integration of a professional platform for document management allows you to optimize the work of an enterprise:

- 35% of expected increase in company productivity due to using electronic document management.
- 65% economy of employees' time and cost of documents.
- 75% reduction in time for processing an electronic document in comparison with paper.
- 80% economy on rental of archival space.

Increased security

Document.Online allows you to increase the security of signing and storing documents, and an electronic signature guarantees:

- integrity of the document;
- the exact date and time of signing the document, confirmed by the Accredited Key Certification Center;
- identification of people who signed the electronic document.

Document protection is provided by Microsoft, all documents are stored on Microsoft Azure servers. Document availability is guaranteed at 99.98%. This means that only 5 minutes per month a break in data access is possible. Taking into account multiple copying of data, the likelihood of data loss in the event of a failure of one of the Microsoft servers is negligible. Even if the carrier is physically destroyed, your data will be restored within an hour.

FarmingOS

The platform integrates and provides data exchange with CROPIO / SAS powered by CROPIO and 1C/1C Agro Web in real time, allowing you to collect, structure and visualize key performance indicators in the context of fields, crops and cost items, which greatly simplifies the decision-making process based on the real economic indicators of an agricultural enterprise.

For implementation, The experience of medium and large-sized farmers was used for the launch of this platform and accounts for direct costs carried by the farm. The platform is capable of working both in the CROPIO / SAS powered by CROPIO -1C Agro Web-farmingOS bundle, and in the CROPIO / SAS powered by CROPIO -farmingOS bundle, providing small and medium-sized farmers with the opportunity to maintain a warehouse, plan technical cards, and conduct their production and the sale of goods with minimal costs.

Languages — Ukrainian, Russian, English

Solution concept:

Visualization of the economy of an agricultural enterprise provides farm management with complete operational data in the most convenient format, which enables the making of operational decisions based on real numbers. This platform is suitable for small and medium-sized farmers who are already using CROPIO/SAS powered by CROPIO and want to increase control over their operations. For example, if there are problems happening in the fields, you can see the current cost of a hectare and decide whether to continue cultivating the land so that the costs do not exceed expected revenues.

Feature set of FarmingOS

Production economics, accounting and analytics

Planning

- Information about the planned start and end dates of agricultural operations;
- Information about the actual start and end of agricultural operations;
- Convenient visualization of agro-operations' performance dynamics in percentage;
- Visualization of the plan for any specific season and field..

Expenditures

- Monitoring of expenses per 1 ha;
- Monitoring of expenses in the context of crops, fields, direct costs (wages, seeds, fertilizers, fuel, chemicals);
- Accumulated expenses (planned, actual);
- The ability to see the costs for any field during any specific period of time.

Income

- Planned and actual income in the context of fields and crops;
- Expected income — the ability to see the current value of your crop;
- Income per hectare from each field.

Key farm performance indicators

- Agro-operations execution dynamics;
- Area under each crop;
- Crop rotation;
- NDVI;
- Direct costs;
- Income;
- Lease terms for land parcels.

Managerial accounting

- Crop production planning;
- Production accounting of agricultural work and services;
- Warehouse (inventory) management.

Functional blocks of FarmingOS

Production economics, accounting and analytics

Visit page

Price

0.70$/ha per year

No free option available

The process of implementing (launching) a solution into agricultural production processes:

No additional hardware is required for platform launch. The average launch time is less than 1 week, depending on the speed of fullfillment of complementary systems, such as CROPIO/SAS powered by CROPIO and 1C/1C Agro Web.

Integration

- 1C
- 1C Agro Web
- CROPIO
- SAS powered by CROPIO

GeoPard Agriculture

GeoPard Agriculture is a comprehensive solution for precision farming, field health and crop productivity analytics. The GeoPard service consists of 12 functional blocks. All of them are available for integration into other software via API. The GeoPard Agriculture development team constantly analyzes the market and implements advanced technologies, improving the service every month. It is available in Ukrainian.

Feature set of GeoPard Agriculture

Management zones based on 30-year history

These are averaged automatically-created multi-year maps of potential yield (based on the analysis of indicators for 30 and last 5 years). The control zones are precise, correspond to the growing season in the field, noise disturbances are removed.

Zones of stability and variability

Identification of the most variable and stable areas during the week, month, season, or based on the historical archive of images (stability and variability of vegetation from season to season).

Multilayer maps

Management zones based on a combination of any data layers available in the GeoPard, including the ability to set the weight of each layer. Examples: yield map + slope map, yield map + organic matter, yield map + slope + nitrogen, etc.

Zone operations

Finding connections between zones to determine the relationships between them and identify the most interesting areas for advanced analytical work (scouting, soil analysis, plant sampling), as well as improving agronomic practices. You can find intersections between any data layer.

Manual adjustment of zones

Zone map may be adjusted by combining and separating individual polygons. The jitter is removed, small polygons merge into the next large zones. Only the required number of points in each polygon is saved to make it easy to manually adjust the zones. The cards are compatible with most modern equipment (seeding, fertilizers, and plant protection products).

Topographic maps

Digital elevation model is based on ERS data; data collected using machinery (harvesters or seeders). Module helps to define control zones based on each data attribute.

Assessment of heterogeneity

Assessment of heterogeneity helps to compare fields and determine which areas will benefit most from the implementation of technologies of differential fertilization, crop protection products, and seeding.

Yield data analysis

This module includes: loading yield data from your monitor; cleaning and correction of the original data; accurate calculation of average and total yield; visualization of both raw and corrected datasets; creation of management zones based on yield data.

Soil data processing

It is based on loaded soil sampling data or sensor data (conductivity, soil moisture, etc.). It provides high density points visualization by using heatmaps; creation of control zones based on each attribute.

VRA maps

These are maps for variable rate application based on control zones. Your rules for calculating rates for each zone may be applied.

Satellite monitoring

12 indices for each image, including 10 vegetation indices: RGB, NIR, EVI2, LAI, NDVI, GCI, GNDVI, IPVI, SAVI, OSAVI, NDWI, WDRVI in processed satellite images with cloud detection technology. Revealing clouds and shadows with an accuracy of 95% (competitors' indicator in this domain does not exceed 80%). Image resolution increased to 3 m. per pixel. Field and region level access.

Field Scouting and Notes

It is mobile application with offline maps and notes for easy usage in the field. It provides full synchronization with the web application.

Functional blocks of Geopard Agriculture

- Management zones based on 30-year history
- Zones of stability and variability
- Multilayer maps
- Zone operations
- Manually adjustment of zones
- Topographic maps
- Assessment of heterogeneity
- Yield data analysis
- Soil data processing
- VRA maps
- Satellite monitoring
- Field Scouting and Notes

Visit page

Price

0.55€/ha per annum

Free trial

Two-week trial period

Integration

Integration is available via API. There is integration with John Deere. This year the GeoPard Agriculture team plans to integrate with Climate, CNH, Trimble.

Hummingbird

Hummingbird Technologies is a platform that provides farmers with full analysis of the crops condition. The company uses its own machine learning algorithms to analyze images from satellites, aircraft and drones. Based on this information, recommendations are given to customers that will improve the efficiency of agricultural production.

Hummingbird Technologies is a British company that cooperates with over 100 agricultural companies in 7 countries around the world. And since 2019 Hummingbird began its active work in the Ukrainian market.

The company focuses on three key areas for agricultural producers:

1) reduction/optimization of fertilizers and plant protection products;

2) increase in productivity;

3) providing complete information for making optimal decisions.

Feature set of Hummingbird Technologies

Crops monitoring

Weed map. Hummingbird uses its own unique image processing algorithms to calculate vegetation indices. Analysis of the values of the main indices (NDVI, LAI, etc.) is used to construct vector maps.

The weed map determines the amount of weeds before seeding and later in the row spacing of arable crops. It fixes greens on the field before sowing (for cereals before sprouting) for spot treatment with herbicides. For crops with wide row spacing (more than 40 cm), weeds are mapped in row spacing by removing the crop from the image and showing the remaining greenery. The diameter of the plant crown should not exceed 20 cm.

Normalized Difference Vegetation Index (NDVI). This map allows you to assess the intensity of the plant vegetation. For the calculation the values of the spectral brightness in the red and near infrared range are used.

The NDVI map informs about the heterogeneity of crops, allows you to estimate the amount of plant mass, to identify problem areas of the field. Follow-up examination will help define the causes of the limp plants and determine how to eliminate them. Potential factors include weeds, drought, surface compaction, problems with seeding, etc.

Crop heterogeneity map

This map allows you to identify areas with slow plant growth. To build a map, the difference in NDVI data between flights is used. Information is provided after each flight, except for the first. Field studies of problem areas are required to determine the causes of slow development. The reason may be the pests, weeds, water deficiency, etc. A timely response will help increase the yield.

Leaf Area Index (LAI). The indicator reflects the ratio of the leaf area per unit ground area.

Green area index (GAI). Green cover — the ratio of the area occupied by plants to the ground where crop is growing. The indicator allows you to assess the state of the crop, identify areas of slow growth, and helps in assessing the potential yield.

Seedling density map is an objective way to assess field germination ability. Density indicators can be used to determine the ratio of actual and planned germination. The map is a grid with cells 25x25 m, in which the number of plants is indicated (units of measurement – thousand pcs/ha).

Nitrogen content map identifies areas with low nitrogen content in the leaves that require treatment with plant growth regulators. It allows you to optimize the applied volume of nitrogen fertilizers.

How will it help the agricultural producer? Thanks to a differentiated approach to determining dosages based on leaf area index data, yield growth is achieved without increasing the volume of applied nitrogen.

Variable rate irrigation map is used in modeling irrigation modes and scheduling irrigation.

Plant lodging risk map

Due to this map, areas of the field where plants develop faster, and there is a risk of lodging, are determined.

How will it help the agricultural producer? The information is used to determine dosages of growth regulators or for further crop care.

Desiccation control map is used to identify areas of a field where crop ripening is not over. NDVI data without threshold value are used.

Variable rate application

Nitrogen variable rate

The solution for differentiated application of nitrogen fertilizers allows you to top-dress your land effectively. To create a map-task for nitrogen diffusion, the platform uses the NDVI index, which shows the actual state of crops (amount of vegetation mass). The specificity of each field (soil differences, relief, differences in the provision of NPK and other elements) and the rate of development of the vegetation mass are also taken into account.

Based on these data, depending on the phase of development and purpose, different nitrogen rates are applied or the application rate is redistributed to increase yields.

Hummingbird Tech's approach is individual for each crop and takes into account the peculiarities of its growth and development. Fly-over in the early stages of growth is carried out to identify problem areas of the field for crops of rapeseed, wheat and barley.

Variable rate application of herbicides
Depending on the degree of weed level, a decision is made on the method of differentiation. The company's solution provides two options — selective and solid with a variable rate.

After receiving a map of the weediness of the field, the agronomist conducts field scouting. The species composition and phases of weed vegetation in the most problematic areas are determined. On the basis of scouting, optimal herbicides and the methods of their differentiation and spraying are chosen. Task maps are compiled for the equipment used with a cell width equal to the averaged width of the spraying boom.

If application of herbicides is done just before seeding, glyphosate herbicides are applied. The seed of many companies is resistant to their influence.

Analysis of weeds after emergence of row crops is carried out using artificial intelligence based on machine learning. The built-in image processing algorithm removes rows of cultivated plants from the images and measures the vegetation activity in the aisles.

Differentiated desiccation

Differentiated spraying saves money on desiccants while maintaining plant productivity. To determine the ripening zones, the UAV monitors field 2-3 days before the harvest. The taken images are joined into orthophoto maps for further analysis by the platform.

A task map can be created directly in the gadget. There, a field is selected from the list or simply indicated on the map. Through the appropriate tab, you go to the maps menu, where you can create a map for differentiated desiccation.

Variable rate application of fungicides

Functional blocks of Hummingbird Technologies

- Crops monitoring
- Scouting
- Variable rate application

Visit page

OneSoil

OneSoil is a Belarusian company that provides farmers with access to a free platform for precision farming from any place in the world.

The company provides services as a cloud platform for precision farming, as well as installation of weather sensors.

Feature set of OneSoil

Land bank management

The farmer gets the opportunity to easily and quickly find his field on the map and select its borders in one click to create a virtual map of the field and obtain extensive information on the field. Also, in the platform it is possible to independently circle the contours or upload a file.

Crop monitoring

OneSoil provides an opportunity to monitor in detail the development of plants by changing the vegetation index NDVI obtained from satellite images. Information about each field is updated every 3–5 days. The platform also makes it easier to walk around the fields. A scout can leave notes in the office or during a field walk — the application will determine where the person is and give hints on how to move. The service also shows the weather forecast for 5 days with an accuracy of 2 kilometers.

Farm operations planning

Variable rate application of fertilizers. Based on the current satellite image, the program identifies three zones with different vegetation index NDVI. The agronomist accurately determines the fertilizer rate for each site and in one click creates a file with a task for the on-board computer. It is also possible to select the desired crop and plan the yield. The program will highlight zones of different yields and automatically calculate the fertilizer rate for each site, taking into account information for the previous three years and based on satellite images.

Functional blocks of OneSoil

- Land bank management
- Crop monitoring
- Farm operations planning

Company is planning to add:

- Harvest forecasting
- Field work planning and control
- Automatic recommendations to the farmer at all stages of work

Visit page

Price

free

The company offers purchasing and installation of devices of its own development — a meteorological sensor and a modem for equipment control.

Integration

- OneSoil sensors

Trimble Ag Software

Trimble Ag Software — is a comprehensive precision farming and field accounting system. The system combines all data into a single ecosystem and simplifies the work with displays in the tractor cab. Precision farming is even easier with AutoSync — automatic synchronization and job assignment system WorkOrder which directly connects to tractor cab.

System module functions

Guidance lines control

- Creating and editing guidance lines
- Synchronization with displays

AutoSync

Communication between displays and the system. Exchange of reference books of machines, units, machine operators, navigation lines, etc.

Equipment monitoring

- Equipment monitoring in real-time
- Tracking location in the mobile application
- Reporting
- Receiving alarm messages including from trailed units

Task assignment to the tractor cab

- Task assignment to the machine operator
- Tracking the progress of tasks
- Setting work parameters — material consumption rate, weather restrictions, navigation guidance lines

Working with tech cards

- Create guidance maps
- Sending the prescription card to the tractor cab

Working with Yield Mapping Data

- Filtering yield maps
- Mapping of productivity zones

Working with weather data

Work planning

- Budgeting
- Planning of crops in the fields

Material Inventory Management

- Keeping inventory records of materials

Mobile app

- Mobile application for displaying information
- Task assignment to machine operators

Agrochemical field survey

- Creation of soil sampling points

Agronomist's Diary

- Data collection
- Adding georeferenced photos

Functional modules of the system

- Guidance lines control
- AutoSync
- Equipment monitoring
- Task assignment to the tractor cab
- Working with tech cards
- Working with Yield Mapping Data
- Working with weather data
- Work planning
- Material Inventory Management
- Mobile app
- Agrochemical field survey
- Agronomist's Diary

Visit page

Цена

from199$ (excluding VAT)

Packages of various functions are available for specific user tasks

Integration

- Possible to integrate with external systems via API
- Integration with John Deere, CNH, 1C systems

There is a demo version of the system. Demo request from the nearest dealers

Self-registration via the system https://www.trimbleag.com/

Features:

	Farmer Starter	Farmer Core	Farmer Pro
User logins	up to 5	up to 5	up to 5
Manage client/farm/field names with boundaries	●	●	●
Map landmarks with mobile app (points, lines, and boundaries)		●	●
Manage guidance lines		●	●
Includes AutoSync™ for synchronization of guidance lines and other data with all connected devices		●	●
Import/export or use third-party APIs to get data to/from precision farming displays		●	●
Track real-time equipment location, current status, and utilization history		●	●
Create and assign work orders, control their status			●
Includes dashboard for weather forecasting and commodity price tracking			●
View and edit task details		●	●
Add materials and track purchases and usage by field with costs		●	●
Generate compliance reports with coverage or as-applied and task details		●	●
Process yield data with yield cleaning tool		●	●
Enter detailed field records manually for seed, chemical, fertilizer, harvest, and other applications			●
Print reports for seed, fertilizer, chemical usage, and field/crop profitability			●
View basic weather with option for upgrading to Ag Premium Weather			●
Using drafting tools to mark management areas based on yield data and other geospatial information			●
Create VRA prescription maps			●
Utilize the mobile app for grid or zone soil sampling, including navigation to sample sites			●
Track bin inventory			●
Grain agreement management and market reporting			●
View Crop Health Imagery for each field			●
Record crop scouting events and create product application recommenda-tions			●
Import UAV imagery			●

Taranis

Taranis is an innovative platform designed to simplify the farmer's work by using high technology and applying the concept of precision farming. The company's software product is an online platform for farmers with access to a variety of data and analytics derived from processing satellite imagery using algorithms developed by the Taranis team.

Functional blocks of Taranis

Calculating the exact number of plants

Using unique technology Taranis can inform farmers about the number of plants regardless of the stage of crop growth. The software can determine the position of each plant to calculate plant germination, row spacing, its length, and even compare data with planting date.

Early detection of weeds

Based on the images, Taranis identifies when a weed emerges in the field and poses a potential threat to the crop, and then classifies it. This type of alert allows Taranis to target specific weed species and can help to create tailored herbicide solutions.

Monitoring the condition of crops and fields

Taranis allows you to calculate the amount of nutrients in plants, water level in the soil, plant temperature and much more. The system helps farmers monitor the health of the field, detect subtle changes and act before they affect the crops.

Growth problems

The platform can analyze images captured during seeding in order to detect growth irregularities while there is time to reseed or to correct the underlying problem. As with the disease model, the extensiveness of the coverage of the field enables a field-wide assessment.

Scouting

Taranis also offers a tool for data harvesting and comprehensive threat management on the spot. The program detects problematic hot spots and prioritizes them for further investigation. Scouts then use a mobile app that directs them to these locations. The scout fills a crop-specific report and the agronomist can view and analyze reports, photos, voice memos and areas of interest to assess crop health straight from the Taranis dashboard and decide on a plan of action. The analysis makes it easy to see infestation rates, trends, action thresholds and even decide on more localized treatment applications.

Management of agricultural operations

Instead of a calendar, boards, notes and timetables, Taranis provides agronomists with an easy-to-use task manager. Agronomist can easily designate tasks and activities to any field, classify and assign tasks to any employee. Then you can view the task history and the current status of the task.

Crops efficiency

Taranis also helps farmers and service providers plan the best strategy to increase ROI for specific crops. Manufacturers and service providers can plan the entire season based on Taranis models.

Functional blocks of Taranis

- Calculating the exact number of plants
- Early detection of weeds
- Monitoring the condition of crops and fields
- Growth problems
- Scouting
- Management of agricultural operations
- Crops efficiency

Price

NNN

Integration

- ...

1C Agro Web

The system integrates and provides two-way data exchange with CROPIO/SAS powered by CROPIO in real time, allowing you to accumulate information from the receipt of materials to the warehouse, further use and harvest, including automatic calculation of operator salaries and fuel movement. The experience of the largest agricultural enterprises in Ukraine was used for the implementation of this system.

Languages — Russian

Solution concept:

Management accounting provides management with complete operational data necessary for the efficient operation of the farm and allows to make decisions based on real numbers. This system takes into account direct costs, which often account for more than 70% of total costs, and is suitable for small and medium-sized farmers who want to monitor their expenses in real time.

One of the main advantages of the web solution is the presence of convenient interface, made of sections filled with information relevant to agricultural production only, and flexible reports that allow to identify costs in the context of each field.

Feature set of 1C Agro Web

Production economics, accounting and analytics

Planning

- Setting up planned rates of fuel consumption for agricultural operations and their prices, the cost of ancillary work, the cost of selling products, as well as the planned prices of materials.
- Formation of technological cards of fields based on the plan of agricultural work in CROPIO / SAS powered by CROPIO.

Wrehouse

- Monitoring of movement of goods and materials and automatic generation of a waybill after the closure of agricultural operations.

Production

- Monitoring of work performed by the personnel and equipment. After the completion of the tasks, two documents are formed in CROPIO/ SAS powered by CROPIO, according to which the wages of tractor drivers are calculated and fuel and lubricants, fertilizers, seeds, chemicals and plant protection products are written off within the warehouse.

Weights

- Here, the movement of goods through the weighing station is recorded.

Salary and staff

- In this module, you can hire staff, keep a time sheet and calculate the salaries of employees of the organization.

Land parcel operational monitoring

- An automated workstation for a land operator was created, which allows you to work with agreements on shares and calculating rent for shareholders, as well as synchronization with the block of land parcels in CROPIO/SAS powered by CROPIO.

Functional blocks of 1C Agro Web

- Production economics, accounting and analytics

Visit page

Price

1$/ha per annum

No free version available

The process of implementing (launching) a solution into agricultural production processes:

No additional hardware is required for system launch, and the time for it depends on the size of the directories required for fullfillment. On average, the time varies from 1 week to 1 month. In order to maintain the system, it is enough to train 1 person who already works with the CROPIO/SAS powered by CROPIO.

Integration

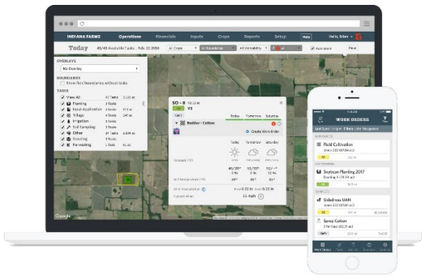
- CROPIO
- SAS powered by CROPIO

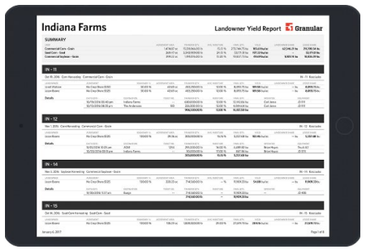
INTERNATIONAL FMS

Systems that are widespread abroad, but lesser-used in Ukraine.

Granular

Visit page





Granular — FMS from Du Pont, is one of the most popular platforms for medium and large-scale agricultural enterprises in North America. It stands out for its flexible ability to provide crop and field planning, team task management and integration of various equipment. The system also provides profit analysis, giving an overview of the financial situation throughout the season with different forecasts for the rest of the season. The software can track resource usage and costs, stock control, and provide price comparisons among similar businesses to anonymously compare the prices you paid for the resources with the prices that peer farms in your area pay. Granular also provides crop reconciliation and reporting, crop inventory analysis, application reports by field, yield by field.

Granular's main goal is to connect the field to the office for more productive farming. This allows farm owners and managers to be in control of all aspects of operations, even when they are mobile, allowing them to make informed decisions at all times. With Granular, farm management can plan and assign tasks to their employees in detail. The software has built-in apps for Android and iOS devices that allow field and office workers to collaborate wherever they are.

In addition, Granular helps companies deal with various reports and allows users to automatically create any dashboard.

Benefits of Granular

1. A user-friendly and convenient solution. Granular is easy-to-use software. The system includes intuitive tools and features that enable companies to view their fields and analyze profits to make informed management decisions on the ground.

2. On-site application. With Granular, farm owners and managers can move their office to the field and vice versa. As a web-based application that is complemented by native Android and iOS applications, the solution allows users to keep track of daily tasks in the field, keeping the office up to date.

3. Specialized functions for everyone. Not all farms are the same and that's what Granular is focusing on. This is why the software has special features for farms that have specific crop management needs. This allows farms of all types and sizes to use the software for a variety of crops.

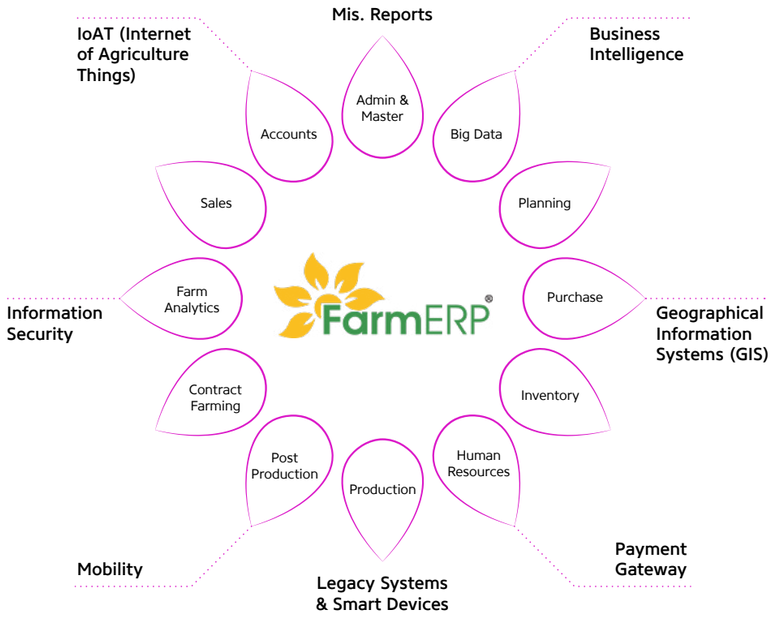
4. Management of multiple locations. Granular is enterprise software and supports multi-site management. This allows farm owners and managers to maintain control over farms dispersed in different locations.

5. Future software and support. Granular is constantly being updated with new features and tools. Software developers work with clients to understand their needs in order to make farming a less difficult process. This makes the software future-proof and scalable as it continues to evolve with customer feedback and new agricultural innovations.

FarmERP

Visit page

FarmERP is a multi-user, integrated software platform for all types of agribusiness. The system has the powerful built-in capabilities of any ERP solution covering all business functions. At the same time, it provides an advanced level of analytics to support business decisions. Key modules are: Administration, Planning, Procurement, Inventory, Manufacturing, Post-Production, Contract Farming, Biotechnology, HR, Invoicing, Field Maps, Quality Control, and Farm Business Intelligence. FarmERP has 380,000 acres under management, with clients in 12 countries. Today more than 50,000 farmers have benefited from FarmERP.

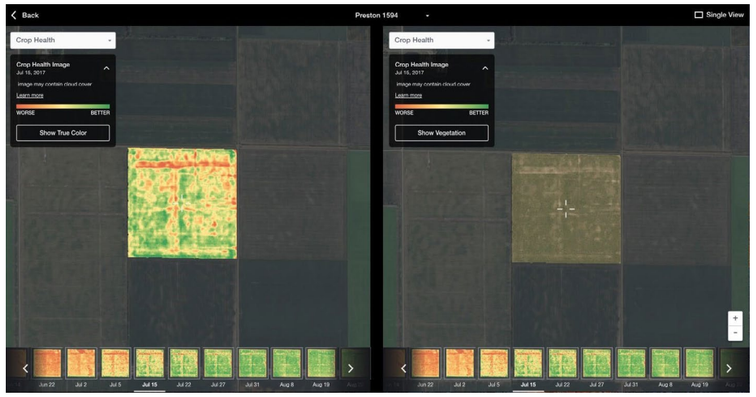


FarmERP can be customized to meet the requirements of any agribusiness and can be easily integrated with smart devices as well as legacy ERP or financial systems. With over 200 different reports and customizable dashboards, it is a scalable, tested and reliable platform on the market.

FarmLogs

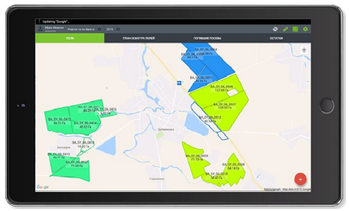
Visit page

FarmLogs is a comprehensive program that allows farmers to manage all aspects of their business. Available as an app for Android and iOS devices, FarmLogs makes it easy to log in and view field activities in one place. Recordings will be organized, secured, and accessible from any desktop or mobile device. The use of interactive maps helps to assess the results of seasonal work and get an overall idea of the crop efficiency. It is also possible to track current prices, compare them with daily price fluctuations. FMS allows you to study weather conditions, track day after day how many units of heat are accumulating in the fields this season, and compare with previous seasons. Whether crops are in an early growth stage or are rapidly approaching maturity, FarmLogs helps users plan field work efficiently by constantly updating growth stage and ripeness estimates.



IN-HOUSE FMS. CORPORATE

Agroprosperis



Agroprosperis has developed its own IT solution for automating business management and increasing the efficiency of agricultural processes. The key feature of FMS from Agroprosperis is full development in the 1C language; the core of the management system is the 1C accounting system. This feature greatly facilitates development and makes it easy to integrate with the company's accounting system and additional services, one of which is a mobile tool for an agronomist, AP Agronomist.

AP Agronomist is a mobile assistant of the farmer, internal development of Agroprosperis. The main function of the application is aimed at helping the agronomist while in the field, to record all the work performed and to record the biological transformation of plants directly on the electronic map of the field. The system allows you to quickly manage material and labor resources, including field work and statistics on the operations performed. There are 4 types of acts in the system for recording the executed work: soil preparation, seeding, taking care of crops, harvesting and inspection report. The data entered by the farmer goes into the company's accounting system, and accounting is carried out up to one business day. This approach allows to significantly speed up the process of collecting and processing information, which makes it possible for Agroprosperis to be more agile in making operational decisions and developing a strategic action plan.

Functions

Fields manager

Thanks to the rapid data harvesting and the consolidation of information on all operations performed in the field, the system builds maps of the profitability of the fields, which are then used by agronomists to make decisions on budget allocation and planning.

Control of agricultural operations

The system maintains a complete history of production, the introduction of commodities and materials and the use of equipment, which allows you to receive a detailed analysis of each stage of the production chain. In addition, management can create and track the ratings of specialists in the production core for various KPIs, thereby seeing the effectiveness of human capital.

Scouting

By integrating NDVI satellite imagery into the company system, farmers and management regularly receive information about the crops condition, which is used to facilitate the scout's work and also, at the post-analysis stage, to identify cause-and-effect relationships based on the results of the season.

Production economics and budgeting

1C implements a wide range of functions for planning and taking into account spent resources.

Analytics

Also, Agroprosperis specialists have developed an additional analytics block based on 1C. Such implementation allows agronomists and management to analyze the effectiveness of various hybrids and fertilizers that were used in the course of the work, and in the future to carry out a comparative analysis based on data from all fields.

Functional solutions

To work at the management level, the Agroprosperis IT infrastructure uses solutions developed on the basis of the 1C accounting system, which allow you to control such areas of agribusiness:

- Fields manager
- Control of agricultural operations
- Scouting
- Production economics and budgeting
- Analytics

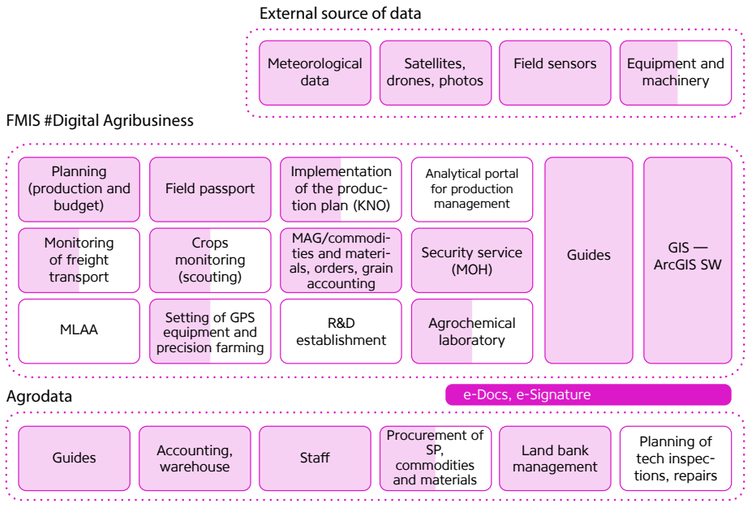
Kernel Digital AgriBusiness

Digital AgriBusiness is an integrated farm management system developed by Kernel.

FMIS includes 9 modules: Planning, Field passport, Operational management (orders, monitoring of equipment in the field and freight transport, logistics warehouse-field and field-elevator, service of GPS and precision farming equipment, agromonitoring and much more), Analytical portal of production management, Crop monitoring, Mobile applications for agronomists and security officers, Mobile application — Manager of Land Assets Administration (MLAA), Research Center, Agrochemical laboratory.

The task of the system is to ensure a continuous process of operational improvement (increasing yields, minimizing costs) through the use of reliable historical and operational data for algorithms and business rules that are able to analyze the maximum number of factors affecting the yield and profit of the company in the planning and implementation of the production program and provide recommendations for making rational decisions.

Objective: to ensure maximum efficiency in the use of each field.



Feature set of DigitalAgriBusiness

1. Planning — a multi-level and complex planning system that aims to simplify and automate the process of creating a production plan with the greatest efficiency, based on empirical data.

The functionality of the module includes the following features:

- Long-term planning of crop rotation in the context of clusters, geofences and a specific field.
- Financial modeling of profitability in the context of each cluster.
- Distribution of crops, breeds/hybrids, yields forecasting.
- Planning seed treatment programs
- Planning a fertilizer program by certain crop.
- Protection planning taking into account the individual characteristics of fields and crops.
- Planning of tillage operations taking into account compaction and predecessors.
- Planning a harvesting campaign.
- Planning of mechanized squads.
- Formation of technological maps, budget of direct costs and requests for the purchase of the necessary commodities and materials for major and support department.

2. MLAA (Manager of Land Assets Administration) — a module for employees of the land service, who are responsible for relations with shareholders. All basic data on the land bank is processed in the 1C and GIS accounting system — ArcGIS.

The mobile application gives land service employees a convenient interface for working with data on shareholders and fields online from a tablet. This should significantly affect the quality of relationships with shareholders and local communities, which in turn minimizes the risks of leaving land plots

3. Implementation of the production plan (KNO) — a module responsible for the implementation of planned works and automation of operational activities.

The module provides the following functions:

- Creation of work orders and requests for commodities and materials (MAG application/ Orders, commodities and materials)
- Release of equipment for work
- Logistics management of commodities and materials from a warehouse in the field
- Monitoring of equipment in the fields
- Closing orders and fields, taking into account quality requirements — meteorological conditions, field border, quality of technical operations, application rates and more (Agricultural monitoring)
- Integration of data from precision farming equipment to link to the order and more detailed assessment of the quality of work performed
- Write-off of commodities and materials (the write-off certificate is signed by the EDS of the Agronomist) — export of the final data into 1C.
- Control of movement and use of each piece of equipment.
- Monitoring the use and write-off of POL by orders.
- Calculation of costs for the work performed in the context of the area.
- Monitoring of cargo transportation using algorithms for processing data from GPS.

4. Monitoring of crops (Scouting), including Mobile application MAG/Scouting.

It is a module for a quick assessment of the field for its compliance with the cultivation technology and the state of crops in general.

Gives possibility to numerically evaluate and digitalize problem areas, find out the reasons and quickly eliminate problems. The Scouting module fills survey calendar of the agronomist — which field with which crop, within which phenophase, he needs to inspect it.

For each phenophase and crop (taking into account the entry and exit from winter) there is an adaptive checklist (Act) — the agronomist conducts a survey using standardized criteria.

Scouting is integrated with the Field Passport, therefore all results and history of surveys are saved in the passport of each field and are available for analysis through the analytical web-portal Crop Monitoring.

Data on recorded harmful objects are used for prompt response, and are also taken into account when making the production plan for the new season

Main functions:

- Classifier of indicators and a scale for assessing the level of development for each culture.
- Planning a monitoring program for each field, crop.
- Control of compliance with the phases of plant vegetation.
- Quality control of the work of agronomists in the fields.

5. Mobile application for grain accounting (KNO) — a module for recording the volume of grown products that are transported from the field to the elevator.

Includes such features:

- Administrative accounting of the quantity and movement of grain.
- Registration of the waybill.
- Integration of data with the accounting system based on the results of unloading products at the elevator.

6. Mobile application for the security service (MOH) — a module used by the security service of a company to prevent theft, unauthorized access to facilities or corrupt use of company resources. Functions:

- Control of access to objects.
- Monitoring of vehicles under protection.

7. Document flow — the module is responsible for the automation of electronic document flow using programs SharePoint and K2.

- Digitalizing of contracts and acts.
- Using EDS for signing documents.

8. Analytical portal for production management

9. 1C Agrodata is a bridge between the FMS system and the 1C holding accounting system. The module allows you to store databases in a structured accounting system of the holding.

- Reference books on equipment, commodities and materials.
- Accounting.
- Warehouse management.
- Personnel management.
- Purchase of spare parts and commodities and materials
- Management of land lease agreements.

10. Business analytics. Power BI is used to build reporting on data from different modules.

Functional modules of Digital AgriBusiness

- Planning
- MLAA (Manager of Land Assets Administration)
- Implementation of the production plan (KNO)
- Monitoring of crops (Scouting)
- Mobile application for grain accounting (KNO)
- Mobile application for the security service (MOH)
- Document flow
- Analytical portal for production management
- 1C Agrodata
- Business analytics. Power BI

MHP Digital Agritech

MHP is one of the largest vertically integrated holdings in Ukraine and Europe. The structure of the agricultural business of the company includes thousands of fields and hundreds of thousands hectares of cultivated land. To work effectively with such volumes, the company pays considerable attention to the integration and development of production management systems. The key in agricultural production for the holding is the MHP Digital Agritech project — a set of initiatives aimed at creating a unified agribusiness management system. The project includes various technical solutions to identify and resolve bottlenecks in production efficiency. Digital Agritech consists of several functional blocks that have been developed internally or selected from among the best solutions on the market.

Functional blocks of MHP Digital Agritech

1. Long-term planning, resource accounting and inventory checking — 1C

To build a season strategy, allocate resources and budget, the company uses a personalized version of the classic accounting solution — 1C. The effectiveness of this solution has been proven by time and stability. 1C allows you to flexibly integrate administrative accounting and management with the company's bookkeeping system, as well as add or modify missing functions.

2. Land bank management — GIS Panorama AGRO (Smart Farming)

GIS Panorama AGRO is used for automation of land bank management and mapping of agricultural plots. The module allows you to systematize all data of the holding and promptly receive information on each of the plots in the company's accounting system. Thanks to this, control over the lease terms is greatly simplified; the risk of the appearance of a "strip farming" (overlapping of field strips) or the cultivation of someone else's land is eliminated. Also, the MHP has individualized the GIS system for its needs, adding the ability to plan and control agricultural operations in the field. Due to this, the history of field processing is kept. Deep integration with 1C allows you to automate the transfer of data on all operations to the general reporting system of the holding, thereby facilitating planning and control tasks. In terms of functionality, this module covers the following tasks for managing a land bank:

- Electronic borders of plots according to the cadastral map of Ukraine and checking of cultivated land with the area according to documents.
- Prompt and reliable information about the status of lease agreements — terms of lease agreements, dates, exchange.
- Agrochemical maps of agricultural land.
- Detailed history of fields.
- View and analysis of thematic maps of land structures, agrochemical state of fields, cultivated crops, applied fertilizers, yield.
- Integration of data on lease agreements and accruals on them into a unified management system (exchange with 1C).
- Automatic calculation of parameters of fields and cultivated areas.
- Drawing up routes and work plans for personnel and equipment.
- Creating reports based on agricultural land data.

3. Control of agricultural operations — RCS Teletrack-AGRO

In order to control the work performed, the holding uses an information and management telematics system from RCS — Teletrack. The system is designed to solve the problems of monitoring transport in agriculture using the GPS satellite system and connection between the onboard equipment and installed software. The use of Teletrack allows MHP to optimize the following processes:

1) Monitoring the work of agricultural equipment.

2) Control of harvest.

3) Control of fertilization.

Operations that the system allows to optimize:

- Control over the location and history of movement of equipment, calculation of the processed field area, taking into account gaps and overlaps, as well as joint processing of the field.
- Control of the technology of work performance: high-speed mode, depth of digging-in, application of free-running and liquid fertilizers.
- Control of refueling, fuel consumption during work and calculation of consumption per 1 ha.
- Control of the crop delivery chain: combine harvester — reloader — grain carrier — elevator.
- Identification of equipment and drivers for time tracking.
- Exchange of information with 1C and other accounting programs.

4. Control of agricultural operations — FieldView

Agro-managers of the holding use the FieldView system to track progress and the status of tasks. This module provides collection and consolidation of operational data from different sources in one place, as well as convenient display of information on cartograms for visualizing field work, creating maps of crops, spraying and harvesting in real time. In practice the user gets:

- Complex profile of each field; real-time analysis of crop productivity using imagery and field maps improves management decisions. Thanks to the system, it is possible to conduct an in-depth analysis of efficiency of each field, crop, hybrid, breed in order to make the best decisions for the next season.
- Maximize productivity by creating an individual plan for each field. Controlling evenness seeding with variable planting density tools.

5. Scouting and exploration of territories — OneSoil

Controlling the state of seedlings, calculating the application rate of nitrogen, phosphorus or potassium fertilizers, opportunities for agro scouting, monitoring weather conditions — basic tasks of a farmer, which allows you to optimize the use of software from OneSoil. The feature set of this module includes:

- Monitoring of plant development by changing the vegetation index NDVI.
- Mobile application for scouting, which allows you to conveniently and quickly leave notes during a field tour or refer scout remotely from the office.
- Based on satellite images, the program identifies three zones with different vegetation index NDVI, automatically determines the fertilizer rate for each site.
- When entering historical data, the program will calculate the planting efficiency of certain crops and the planned yield.

6. Document flow and organization of processes — K2

The goal of MHP is the digitalization of all processes and workflow. To implement this goal, the holding uses the K2 software solution. The system allows managers to configure and optimize the following tasks:

- Organization of document flow for work: automatic creation of reports, task sheets, inventory statements and more.
- The flexibility of K2 allows you to create multifunctional forms for different work processes and integrate the system with 1C.
- Security is ensured by two-way encryption.

7. Business Analytics — Power BI

To create dashboards and display thousands of rows of data, MHP uses a business analytics tool — Power BI. The flexibility of this system allows integration of almost any data source, from sensory information to live data and related news services.

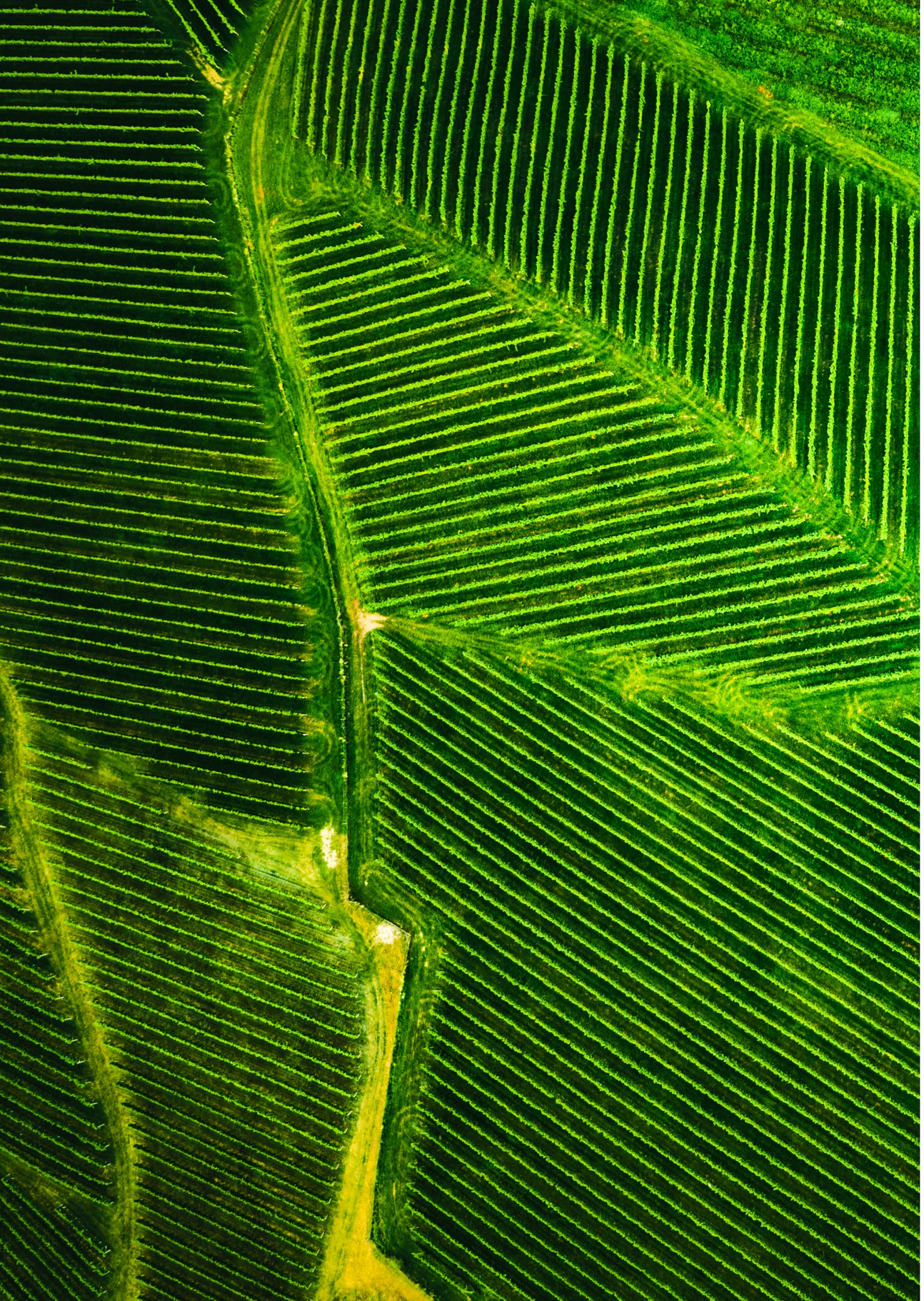
Together with ERP for agricultural business or 1C, the analytics tool provides the user with a quick overview of all relevant KPIs for farmers and any metrics such as weather information, commodity prices, industry news and more.

8. Data storage and processing — MS Azure

The holding uses Microsoft Azure to collect, store and process data. The platform provides the ability to consolidate data from different sources and store it securely on cloud servers.

Functional blocks of MHP Digital Agritech

- Long-term planning, resource accounting and inventory checking — 1C
- Land bank management — GIS Panorama AGRO (Smart Farming)
- Control of agricultural operations — RCS Teletrack-AGRO
- Control of agricultural operations — FieldView
- Scouting and exploration of territories — OneSoil
- Document flow and organization of processes — K2
- Business Analytics — Power BI
- Data storage and processing — MS Azure



Thank you

Thank you for your time and reading our guide! We strive to constantly replenish and expand the base of available solutions and cases. It is very important for us to offer our clients and partners comprehensive and high-quality information that will help make effective decisions.

Modern technologies have already become an integral part of agricultural production, and every day we get massive opportunities and more solutions. If you have such a solution, but it was not presented here, please write to us at start@agrohub.org, we will be happy to update our next edition.

The project was created by the Agrohub team, with the support of Top Lead and AgFunder. We hope that our joint work will be useful to you.

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