



AgriTech Solutions: Innovating VET for Sustainable Agriculture
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2024-1-RS01-KA210-VET-000244168

FIELD VISITS

Precision farming

Experts/organizations: ZZ "STUBA", TD DZP KLECHOVCE DOOEL, ADUT GVN, AG FUTURA Technologies, „KAV KOMERC AND AGRO KAV KOMERC", COMPANY „STOJCHEVI and WINERY ARBESKA", INDIVIDUAL FARMER MARJAN TANCHEV, LISA – KOM KAVADARCI, INDIVIDUAL FARMER STEFAN STOJCHEV, AGRIJA DOOEL, Individual farmers groups and individuals, IZ Branko Atanasov, Livestock farm

Engaged teachers: Stefanovski Saso, Milosheva Zaklina, Jovanova Kristina, Doncheva Milica, Nikolov Efremcho, Slavkovic Sonja

Location: Kumanovo, Sveti Nikole, Skopje, Strumica, Kavadarci, Valandovo, Veles

Short description

At the heart of AGFT's operations is a highly qualified team of technical, research and administrative staff, capable of tackling complex challenges in agricultural and food systems. Over the past nine years of continuous growth and expansion, AGFT has emerged as one of the few companies in the region uniquely positioned to provide expert consulting services and digital solutions for modern food production.

Since 2017, AgFutura has launched a new line of services in the field of precision agriculture. This group of services includes sophisticated soil sampling based on satellite data and soil sample extraction supported by the latest hardware technologies. The results are analyzed through the most advanced algorithms that deliver economic maps with the highest precision. The approach used allows for the highest possible profit from the available resources of agricultural farms.

In September 2017, the first project in the field of soil sampling and economic mapping was implemented, covering more than 1000 ha of land intended mainly for the production of cereals and industrial crops. The maximum daily coverage capacity is approximately 400 ha.

E-agriculture refers to the design, development and application of innovative ways to use information and communication technologies (ICT) in the rural domain, with a primary focus on agriculture and food, including fisheries, forestry and



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livestock. Technological application, facilitation, support of standards and norms, capacity development, education and extension belong to the broader concept of e-agriculture. E-agriculture offers unprecedented opportunities for accelerating the development of agriculture, however, an appropriate environment is needed to enable the technological potential.

Project "Digitalization of Farms in the Western Balkans" - RAMAS system

Ag Futura implemented the Remote Agricultural Monitoring and Advisory System (RAMAS) technology on several farms, supported by USAID (Palladium) and GIZ.

For example, on Ruse Milosavljev's farm, a Mavic 3 Multispectral drone was used to capture and analyze NDVI maps, enabling real-time monitoring of crop health and nutritional status. On Sasha Mitrev's farm, the data was used for precise irrigation according to needs, and on Filip Kamchev's vineyard, health status cards were created for the vineyards, optimizing interventions and spraying.

"SOIL" program – soil analysis and mapping

The technical module includes extraction of soil samples at georeferenced points, chemical, physical and biological analysis in the laboratory, and creation of management zones (variable rate zones – VRT).

This approach detects anomalies such as acidity, salts, erosion, and provides a basis for introducing VRT technologies and improving soil health and sustainability.

Drone services – NDVI monitoring

Since September 2019, Ag Futura has been offering drone services for requesting NDVI plant indices, implemented in regions such as Kumanovo and Strumica.

These recordings and data help in the early detection of stress, pests and health disorders, increasing productivity through timely and effective interventions.

"Center for Digital Agriculture" – a startup project supported by FISTR

Ag Futura developed the "Center for Digital Agriculture" project, which received financial support from the Innovation and Technological Development Fund (FISTR) in 2021.

Through this center, the development of digital tools, platforms and applications to support farmers in data management and decision-making is planned.

Important additional information and achievements



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They participated in the international conference AGROMAK 2025, where they presented their advanced solutions: satellite data, IoT, and artificial intelligence for digitalization in agriculture.

Ag Futura is part of the "Digital Transition Alliance" in agriculture and the food industry, signed in December 2023.

Greenhouse producers every year start implementing some innovations in terms of innovations in the application of technology in agriculture. They use sensors to measure temperature, soil moisture and pH. They use automatic irrigation and fertilization systems, however, education on their application is insufficient to be able to

other technologies should also be applied.

Stojan Mitrov, owner of the company Lisa - Kom from Kavadarci, which works with drones for the company is not specialized exclusively in precision agriculture, the company uses drones and technology for precision agriculture and a service for Disinfection, Disinsection and Deratization. According to Mr. Stojan Mitrov, owner of the company Lisa - Kom from Kavadarci, it was founded in 2002 and works with drones for precision agriculture and a service for Disinfection, Disinsection and Deratization.

So the main activity is DDD services, but drone services are also included, especially for municipal and agricultural purposes in the so-called precision agriculture. Although the company is not specialized specifically in precision agriculture, it uses drones and technology for precise application of chemical agents.

In Macedonia, there are two companies that specialize in precision agriculture: Agridron and Agfutura, which offer advanced solutions for precision agriculture through the use of drones (drone spraying, photogrammetry, NDVI analysis).

For more efficient agricultural protection, in our city of Kavadarci, measuring stations for so-called smart agriculture have been established, which collect data on weather, humidity and other parameters. This information can be combined with so-called drone applications in order to achieve more efficient agricultural protection.

Conclusion

Ag Futura Technologies actively promotes and applies precision agriculture technology through:

- RAMAS remote monitoring and analytics system,



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- SOIL – digital soil mapping and introduction of VRT,
- Drone NDVI analyses,
- Center for digital agriculture with a startup platform,
- Integration of superior tools (IoT, AI, satellites) and active participation in national and regional initiatives.

These projects practically increase yields, optimize resource use, and improve the sustainability of agricultural practices in North Macedonia and regionally.

With the education itself on the use of technologies in agriculture, they will gain knowledge and application of all technologies, as well as this technology, with the help of which they know how to accurately determine when to fertilize and irrigate, by applying optimal conditions for growth and development. As a result of the change in technologies, new changes in agriculture for the application of new technologies also come. By inserting them into the curricula, the number of educated generations will increase who will be able to more easily and accurately use the increasing technology that is applied in agriculture, which is of great benefit to everyone.

Lisa – Kom is a family company from the city of Kavadarci, which, in addition to being registered for DDD services, also has a clear and precise application of drone technology for spraying agricultural and municipal activities. In our country, there are two companies, Agridron and Ag future, which offer a wide range of agricultural services using precision drones.